

**SHARP**

# SERVICE MANUAL

## 维修说明书

S72F3VC-H91//

**VHS VIDEO CASSETTE RECORDER****VHS 盒式磁带录象机****MODELS**  
**型 号**

<b>VC-H91</b>	<b>VC-H91ETS</b>
<b>VC-H96</b>	<b>VC-H96ETS</b>
<b>VC-H980</b>	<b>VC-H980ETS</b>

In the interests of user-safety (Required by safety regulations in some countries) the set should be restored to its original condition and only parts identical to those specified should be used.

为了使用者的安全 (有些国家用安全规定加以要求), 修理本装置时必须完全保持其原有配件状态, 更换只得使用规定者。

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## SPECIFICATIONS

Format:	VHS PAL/SECAM/MESECAM/NTSC/NTSC 4.43 standard (VC-H91/VC-H91ETS) VHS PAL/MESECAM/NTSC/NTSC 4.43 standard (Except VC-H91/VC-H91ETS)
Video recording system:	Two rotary heads, helical scan system
Video signal:	PAL/SECAM/NTSC colour and monochrome (CCIR system: B/G, I, D/K, M)
Recording/playback time:	240 min. max. with SHARP E-240 tape (PAL/SECAM/MESECAM SP mode) 480 min. max. with SHARP E-240 tape (PAL/SECAM/MESECAM LP mode) 160 min. max. with SHARP T-160 tape (NTSC SP mode) 480 min. max. with SHARP T-160 tape (NTSC EP mode)
Tape width:	12.7 mm
Tape speed:	23.39 mm/sec. (PAL/SECAM/MESECAM SP mode) 11.70 mm/sec. (PAL/SECAM/MESECAM LP mode) 33.35 mm/sec. (NTSC SP mode) 16.68 mm/sec. (NTSC LP mode) 11.12 mm/sec. (NTSC EP mode)
Antenna:	75 ohm unbalanced
Receiving channel:	VHF Channel E2-E12 UHF Channel E21-E69
RF converter output signal:	VHF Channel E30-E39 (Adjustable). Preset to E36 channel (VC-H91/VC-H96/VC-H980) VHF Channel E30-E39 (Adjustable). Preset to E39 channel (VC-H91ETS/VC-H96ETS/VC-H980ETS)
Power requirement:	AC 110~240V, 50/60 Hz
Power consumption:	Approx. 22W at AC 220V/50Hz (Except VC-H980/VC-H980ETS) Approx. 24W at AC 220V/50Hz (VC-H980/VC-H980ETS)
Operating temperature:	5°C to 40°C
Storage temperature:	- 20°C to 60°C
Weight:	Approx. 4.8kg (VC-H91/VC-H91ETS) Approx. 4.9kg (VC-H96/VC-H96ETS) Approx. 5.1kg (VC-H980/VC-H980ETS)
Dimensions:	380 mm (W) x 320.7 mm (D) x 89.8 mm (H)
VIDEO	
Input:	0.5-2.0 Vp-p, 75 ohm
Output:	1.0 Vp-p, 75 ohm
AUDIO	
Input:	0 dBs = 0.775 Vrms
Input:	Line: - 8 dBs, more than 47k ohm (With - 4 dB/ - 8 dB ATT. SW)
Output:	Line: - 8 dBs, less than 1k ohm
Accessories included:	75 ohm coaxial cable Operation manual Infrared remote control Battery AC cord Audio cable AC cord round pin attachment plug (VC-H91ETS/VC-H96ETS/VC-H980ETS) AC cord flat blade attachment plug (VC-H91/VC-H96/VC-H980) Game accessories (Except VC-H91/VC-H91ETS/VC-H980ETS) AC plug adapter (VC-H91/VC-H96/VC-H980) Microphohe (VC-H980/VC-H980ETS)

As part of our policy of continuous improvement, we reserve the right to alter design and specifications without notice.

Note: The antenna must correspond to the new standard DIN 45325 (IEC 169 - 2) for combined UHF/VHF antenna with 75 ohm connector.

## 规格

形	式	: VHS (家庭用录像机) PAL/SECAM/MESECAM/NTSC 4.43标准型 (型号: VC-H91/VC-H91ETS) VHS (家庭用录像机) PAL/MESECAM/NTSC/NTSC 4.43标准型 (型号: VC-H91/VC-H91ETS除外)
视 频 记 录 方 式	: 双旋转磁头螺旋形扫描形式	
视 频 信 号	: PAL/SECAM/NTSC(彩色和单色度信号) (CCIR方式: 蓝色背景, I, D/K, M信号)	
记 录 再 现 时 间	: 夏普E-240录像磁带最大240分(PAL/SECAM/MESECAM:标准转速SP方式) 夏普E-240录像磁带最大480分(PAL/SECAM/MESECAM:缓慢转速LP方式) 夏普T-160录像磁带最大160分(NTSC:标准转速SP方式) 夏普T-160录像磁带最大480分(NTSC:超慢转速EP方式)	
录 象 磁 带 带 宽	: 12.7毫米	
走 带 速 度	: 23.39毫米/秒(PAL/SECAM/MESECAM: SP方式) 11.70毫米/秒(PAL/SECAM/MESECAM: LP方式) 33.35毫米/秒(NTSC: SP方式) 16.68毫米/秒(NTSC: LP方式) 11.12毫米/秒(NTSC: EP方式)	
天 线	线 : 75欧姆, 非平衡式	
接 收 频 道	: VHF (甚高频) 频道E2~E12 UHF (超高频) 频道E21~E69	
射 频 变 换 器 输 出 信 号	: VHF (甚高频) 频道E30~E39 (可调节), 出厂预设预道为E36 (型号: VC-H91/VC-H96/VC-H980) VHF (甚高频) 频道E30~E39 (可调节), 出厂预设预道为E39 (型号: VC-H91ETS/VC-H96ETS/VC-H980ETS)	
电 耗 功 率	: 源 : 交流110~240伏, 50/60赫兹 于交流220伏, 50赫兹时, 约22瓦(型号: VC-H980/VC-H980ETS除外) 于交流220伏, 50赫兹时, 约24瓦(型号: VC-H980/VC-H980ETS)	
工 作 温 度	: 5℃~40℃	
存 放 温 度	: -20℃~60℃	
重 量	: 约4.8公斤(型号: VC-H91/VC-H91ETS) 约4.9公斤(型号: VC-H96/VC-H96ETS) 约5.1公斤(型号: VC-H980/VC-H980ETS)	
尺 寸	: 380(宽)×320.7(深)×89.8(高)毫米	
视 频 信 号	: 入 : 0.5~2.0Vp-p, 75欧姆 1.0Vp-p, 75欧姆(型号: VC-H96/VC-H96ETS)	
音 频 信 号	: 出 : 1.0Vp-p, 75欧姆 0分贝=0.775伏均方根值	
输 入	: 线路: -8分贝、47千欧姆以上(附-4分贝/-8分贝ATT开关)	
输 出	: 线路: -8分贝、1千欧姆以下	
附 属 品	: 天线用75欧姆同轴电缆 使用说明书 红外线遥控器 电池 交流电源引线 音频装置用电线 交流电源引线圆销连接插头(型号: VC-H91ETS/VC-H96ETS/VC-H980ETS) 交流电源引线扁平销连接插头(型号: VC-H91/VC-H96/VC-H980) 电子游戏附件(型号: VC-H91/VC-H91ETS/VC-H980ETS除外) 电源插头转换器(型号: 仅限于VC-H91/VC-H96/VC-H980) 麦克风(型号: VC-H980/VC-H980ETS)	

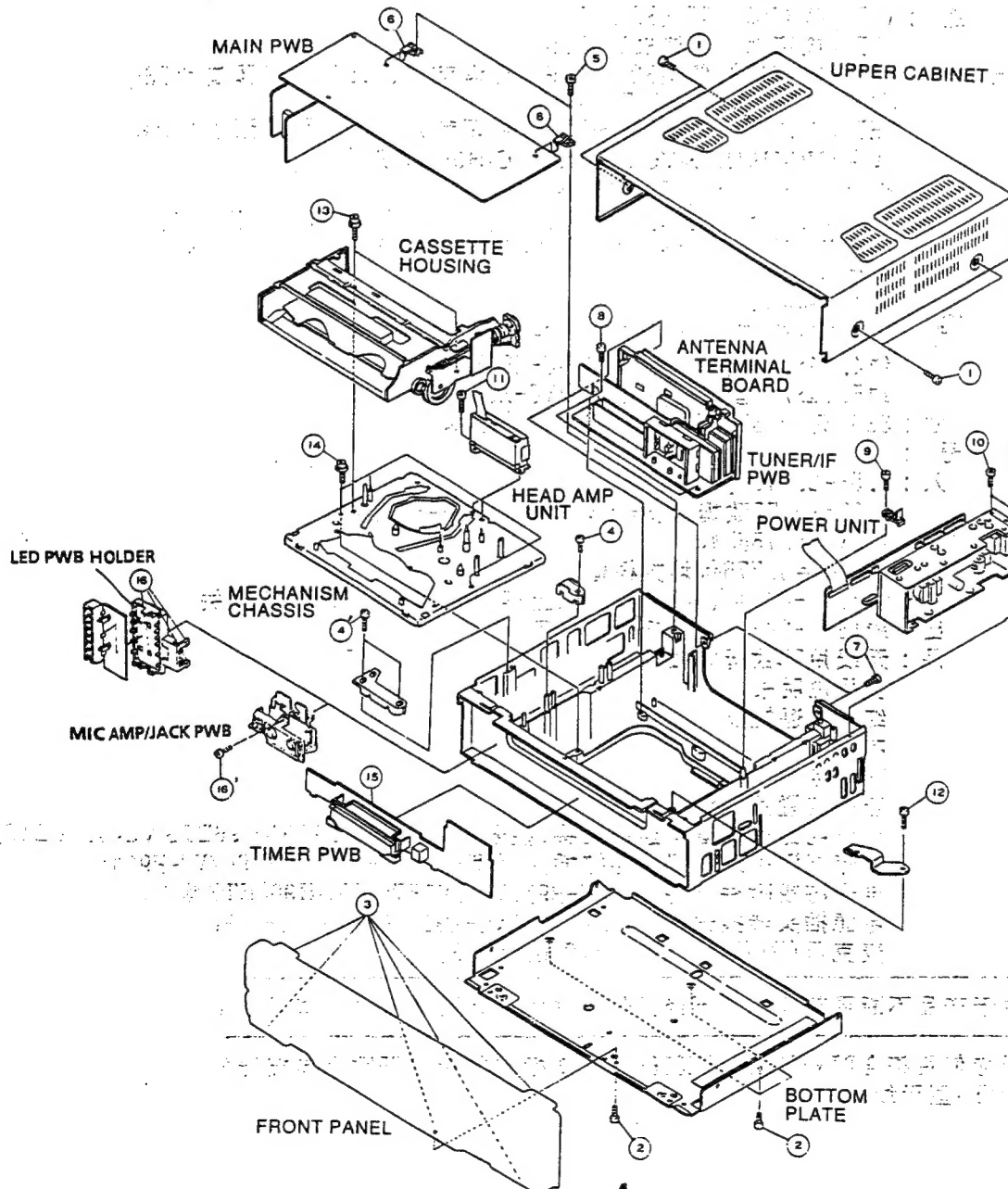
由于产品不断更新换代, 不经预告而改变设计及其规格的情况。

注: 天线应使用符合DIN45325 (IEC169-2) 新标准的带有75欧姆连接器的UHF/VHF型天线。

## DISASSEMBLY AND REASSEMBLY

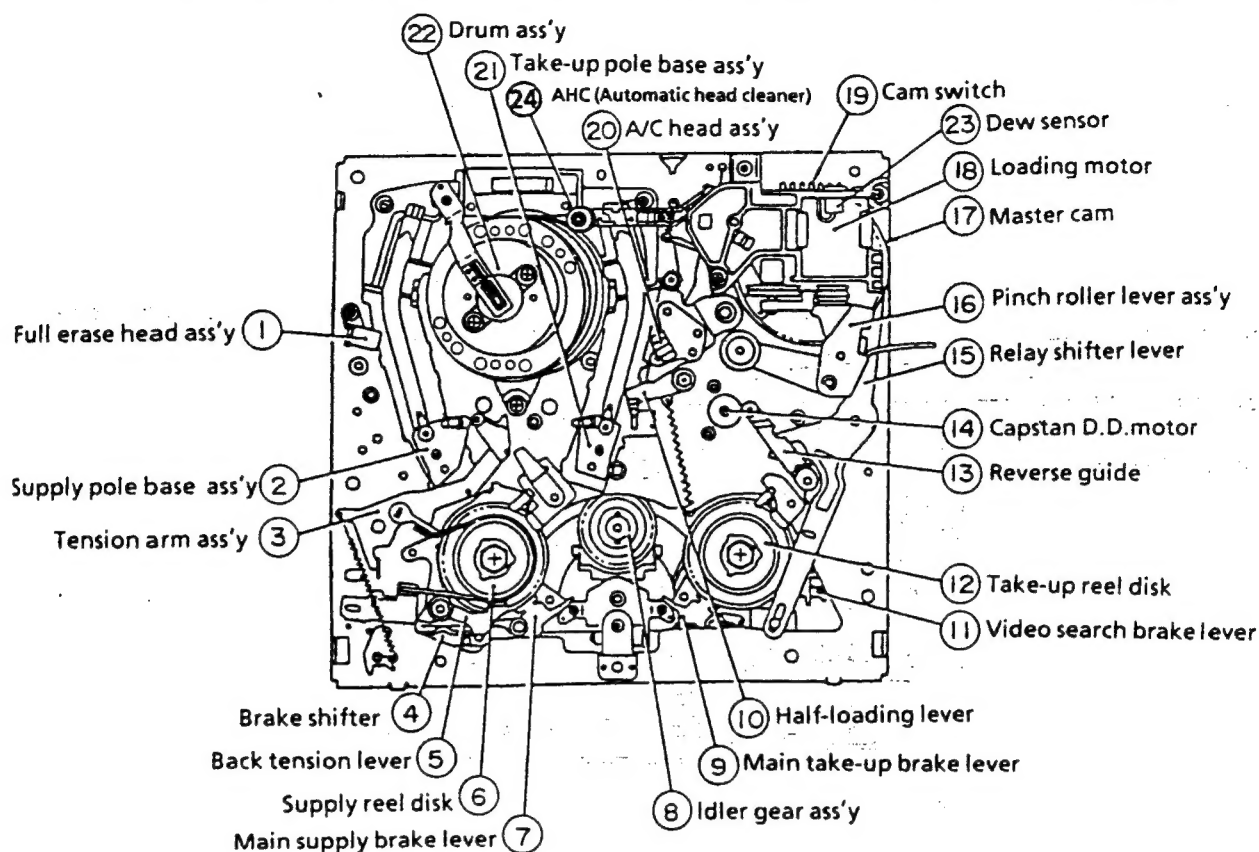
- UPPER CABINET:** Remove 4 screws ①.  
Remove the upper cabinet by sliding it backward.
- BOTTOM PLATE:** Remove 4 screws ②.  
Remove the bottom plate by sliding it backward.
- FRONT PANEL :** Remove 5 clips ③ from the upper and lower parts of the front panel respectively, and remove the front panel.
- MAIN PWB :** Remove 1 screw ④ and remove the holder. (Except VC-H980/H980ETS)  
Remove 2 screws ④' and remove the holder. (VC-H980/H980ETS)  
Remove 2 screws ⑤ and the clip from main PWB holders ⑥.  
Holding the top of the main PWB, pull out the main PWB.

- ANTENNA TERMINAL BOARD :** Remove 2 screws ⑦.
- TUNER/IF PWB :** Remove 2 screws ⑧.
- POWER UNIT :** Remove 1 screw ⑨ from the power unit holder.  
Remove 2 screws ⑩.
- HEAD AMP UNIT :** Remove 2 screws ⑪.
- CASSETTE HOUSING :** Remove 1 screw ⑫ and 2 screws ⑬.
- MECHANISM CHASSIS :** Remove 3 screws ⑭.
- TIMER PWB :** Remove 2 clips ⑮.
- LED PWB HOLDER :** Remove 4 clips ⑯.  
(Except VC-H980/H980ETS)
- MIC AMP/JACK PWB :** Remove 1 screw ⑰.  
(VC-H980/H980ETS)



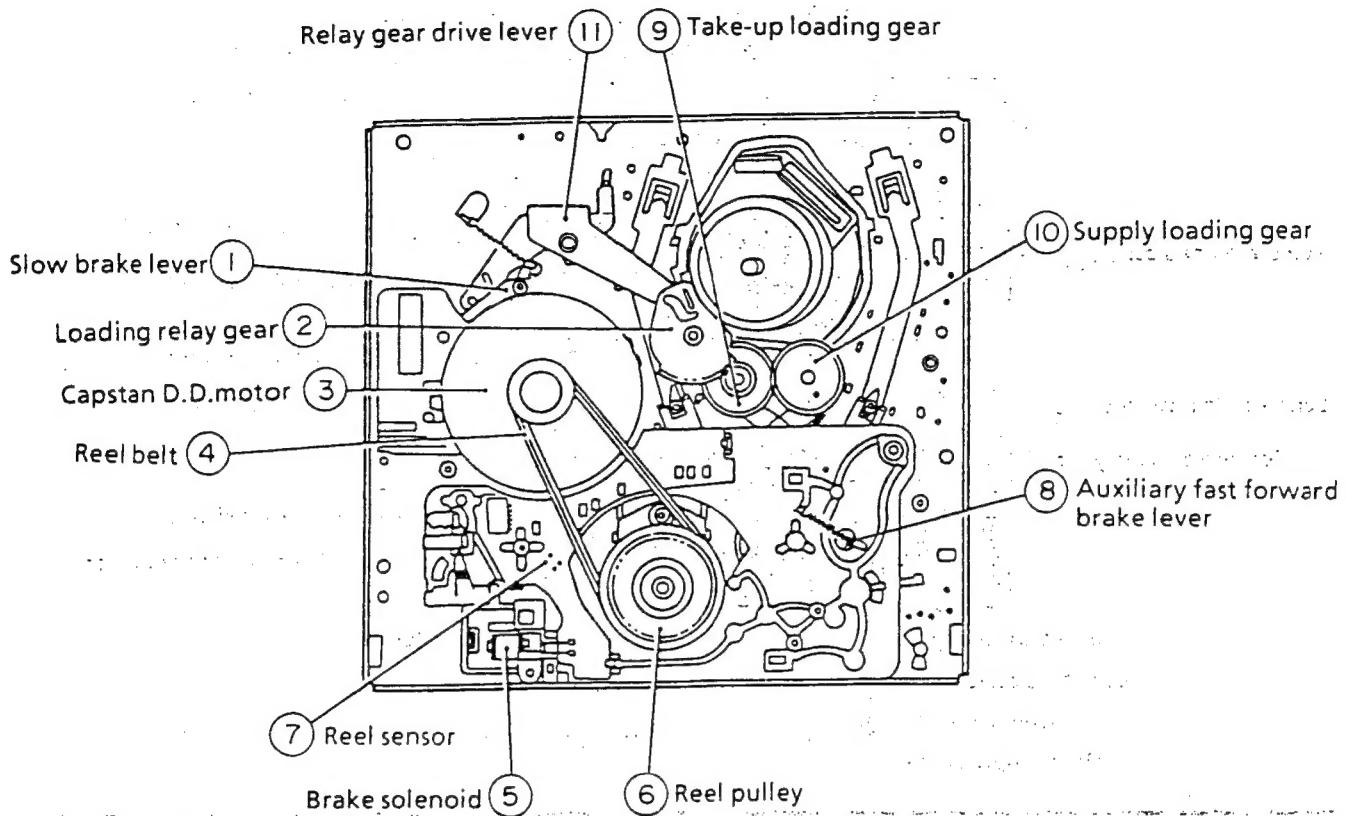


## FUNCTION OF MAJOR MECHANICAL PARTS (TOP VIEW)



No.	Function	No.	Function
1.	Full erase head ass'y Erase the whole records on the tape in the recording mode.	13.	Reverse guide Pulls out the tape in the video search rewind mode, and controls the tape drive train height with the upper and lower guides.
3.	Tension arm ass'y Detects the tension of tape while running, and brakes the supply reel disk via the tension band.	15.	Relay shifter lever Transmits the operation of the master cam to the brake shifter, and operates the reverse guide.
4.	Brake shifter Set the position of brake or the like in accordance with the modes such as stop and playback.	16.	Pinch roller lever ass'y Press-fits the tape to the capstan during tape running. The right protrusion switches the clutch of the cassette housing control assembly in "tape eject", and makes the mechanism eject the tape.
5.	Back tension lever Brakes the supply reel disk to a certain degree to prevent tape slackening during "half-loading", "loading" and "shifting from playback to video search rewind".	17.	Master cam Turns clockwise during loading, and counterclockwise during unloading, and moves the shifter or the like in accordance with each mode.
7.	Main supply brake lever Brakes the supply reel disk to prevent tape slackening when the unit is stopped in fast forward or rewind mode.	18.	Loading motor A motive power which drives the mechanism. It transmits the power to the master cam and cassette housing control assembly via the belt.
9.	Main take-up brake lever Brakes the take-up reel disk to prevent tape slackening when the unit is stopped in fast forward or rewind mode.	19.	Cam switch Rotates synchronously with the master cam, and detects the position of each mode by means of the internal switch.
10.	Half-loading lever Bring the tape in contact with the A/C head, putting it in half-loading state in the fast forward or rewind mode.	23.	Dew sensor An element which detects condensation inside the unit. This element is activated, when it senses condensation, to interrupt the mechanism.
11.	Video search brake lever It is in contact with the take-up reel disk normally, and brakes it to a certain degree. It applies larger brake in the video search rewind mode.		

## FUNCTION OF MAJOR MECHANICAL PARTS (BOTTOM VIEW)



No.	Function	No.	Function
1.	<b>Slow brake lever</b> Gets in contact with the capstan D.D. motor linking to the master cam in the slow still mode, and brakes it to a certain degree.	7.	<b>Reel sensor</b> An element which sheds the light onto the reflection plate affixed to the bottom side of the reel disk, and detects the rotation of the reel disk through receiving the reflected light.
3.	<b>Capstan D.D. motor</b> A motive power which runs the tape. It transmits the power via the reel belt.	8.	<b>Auxiliary fast forward brake lever</b> Brakes the supply reel disk to a certain degree in the fast forward and rewind modes.
4.	<b>Reel belt</b> Transmits the power to run the tape to the reel pulley.	9.	<b>Take-up loading gear</b> Shifts the take-up pole base and guide roller via the loading relay gear, and applies the tape around the drum assembly, as well as transmits the power to the supply loading gear.
5.	<b>Brake solenoid</b> Adsorbs and holds the brake shifter in the fast forward and rewind modes, and releases it in the stop mode.	10.	<b>Supply loading gear</b> Shifts the supply pole base and guide roller via the take-up loading gear, and applies the tape around the drum assembly.
6.	<b>Reel pulley</b> Transmits the power of the capstan D.D. motor to the reel disk via the reel idler.	11.	<b>Relay gear drive lever</b> Transmits the movement of the master cam to the take-up loading gear via the loading relay gear.







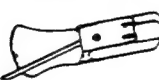



## ADJUSTMENT, REPLACEMENT AND ASSEMBLY OF MECHANICAL UNITS


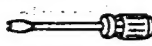


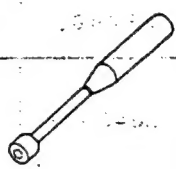


Here we will describe a relatively simple service work in the field, not referring to the more complicated repairs which would require the use of special equipment and tools (drum assembly replacement, for example).

We are sure that the easy-to-handle tools listed below would be more than handy for periodical maintenance to keep the machine in its original working condition.

### TOOLS NECESSARY FOR ADJUSTING THE MECHANICAL UNITS

The following tools are required for proper service and satisfactory repair.

No.	Jig Item	Part No.	Code	Configuration	Remarks
1	Reel Disk Height Adjusting Jig	JiGRH0002	BR		These Jigs are used for checking and adjusting the reel disk height
2	Master Plane Jig	JiGMP0001	BY		
3	A/C Head Tilt Adjusting Jig	JiGACH-F18	BU		This Jig is used for setting the A/C head tilt.
4	Torque Gauge (90g)	JiGTG0090	CM		These Jigs are used for checking and adjusting the torque of take-up and supply reel disks.
	Torque Gauge (1.2 kg)	JiGTG1200	CN		
5	Gauge Head	JiGTH0006	AW		
6	Cassette Torque Meter	JiGVHT-063	CZ		This cassette torque meter is used for checking and adjusting the torque of take-up for measuring tape back tension.
7	Tension Gauge (300g)	JiGSG0300	BF		There are two gauges used for the tension measurement, 300 g and 2.0 kg.
	Tension Gauge (2.0kg)	JiGSG2000	BS		
8	Hex Wrench (0.9mm)	JiGHW0009	AE		These Jigs are used for loosening or tightening special hexagon type screws.
	Hex Wrench (1.2mm)	JiGHW0012	AE		
	Hex Wrench (1.5mm)	JiGHW0015	AE		
9	Alignment Tape (PAL)	VROCPSV	CK		These tapes are especially used for electrical fine adjustment.
	Hi-Fi Alignment Tape (PAL)	VROCBFFS	CB		
	Alignment Tape (NTSC)	VROATSV	CK		
	Alignment Tape (NTSC)	VRONBZZS			
	Alignment Tape (NTSC)	VR9EBZCS	BP		
10	Drum Replacing Jig	JiGDT-0001	BG		This is used for replacement of the VCR's upper drum.

No.	Jig Item	Part No.	Code	Configuration	Remarks
11	Tension Gauge Adapter	JiGADP003	BK		This Jig is used with the tension gauge. Rotary transformer clearance adjusting Jig.
12	Special Bladed Screwdriver	JiGDRIVERH-4	AP		This screwdriver is used for adjusting the guide roller height.
13	Tension Band and Plate Adjusting Jig	JiGDRIVER-6	BM		This Jig is used for adjusting the tension band and tension plate.
14	Torque Driver	JiGTD1200	CB		This is used to screw down resin-made parts: the specified torque is 5 kg.
15	Box Driver	JiGDRIVER110-7	AS		This Jig is used for height adjustment of the A/C head and X-position.
		JiGDRIVER110-4	AV		This Jig is used for height adjustment of the retaining guide.
16	Retaining Guide Height Adjusting Jig	JiGGH-F18	BU		This Jig is used for height adjustment of the retaining guide.
17	Reverse Guide Height Adjusting Jig	JiGRVGH-F18	BU		This Jig is used for height adjustment of the reverse guide.

# MECHANICAL PARTS REQUIRING PERIODICAL INSPECTION

Use the following table as a guide to maintain the mechanical parts in good operating condition:

Parts	Maintained	500 hrs.	1000 hrs.	1500 hrs.	2000 hrs.	Possible symptom encountered	Remarks
Guide roller ass'y		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>	Lateral noises Head occasionally blocked	Abnormal rotation or significant vibration requires replacement.
Supply impedance roller		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>		Clean with pure high quality isopropyl alcohol.
Supply impedance roller (inner hole and shaft)			<input type="checkbox"/>		<input type="checkbox"/>		Clean tape contact part with the specified cleaning liquid.
Supply impedance roller flange		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Retaining guide		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Slant pole		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>		
Video head (Upper drum ass'y)		<input type="checkbox"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="radio"/>	Poor S/N ratio, no colour	Clean tape contact area with the specified cleaning liquid.
Full-erase head		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>	Poor colour, beating	
A/C head		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>	Sound too small or distorted	
Lower drum ass'y		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>	Poor flatness of the envelope with alignment tape	
Capstan D.D. Motor		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>	No tape running, uneven colour	
Pinch roller		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>	No tape running, tape slack	
Reel belt			<input type="checkbox"/>		<input type="radio"/>	No tape running, tape slack, no fast forward/rewind motion	
Loading belt			<input type="checkbox"/>		<input type="radio"/>	Cassette not loaded or unloaded	
Cassette loading belt			<input type="checkbox"/>		<input type="radio"/>		
Tension band ass'y					<input type="radio"/>	Lateral image swing	
Loading Motor					<input type="radio"/>	Cassette not loaded or unloaded	
AHC (Automatic Head Cleaner)			<input type="radio"/>		<input type="radio"/>		Replace the roller of the cleaner when it wears down. Just change the AHC roller assembly for new one.
Reel block*						See the chart below.	
* See the table below for servicing the reel block parts.							
Supply/Take-up reel disks			<input type="checkbox"/> △		△○	No tape running, tape slack	Clean with pure high quality isopropyl alcohol.
Video search brake lever					<input type="radio"/>		
Idler gear ass'y					<input type="radio"/>	No tape running	
Reel Pulley			<input type="checkbox"/> △		<input type="checkbox"/> ○		
Main supply/take-up brake levers					<input type="radio"/>	Tape slack	

**NOTE:** ○: Part replacement.  
☐: Cleaning (For cleaning, use a lint-free cloth dampened with pure isopropyl alcohol).  
△: Oil refilling (The indicated point should be lubricated with high quality spindle oil every 1000 hrs).

If the reading is out of the specified value, clean or replace the part.

## REMOVAL AND REASSEMBLY OF CASSETTE HOUSING CONTROL ASSEMBLY

### • Removal

1. Set the cassette ejected condition in the cassette eject mode.
2. Unplug the recorder from the main source.
3. Follow the procedures below in the specified order.
  - a) Remove the cassette loading belt ①.
  - b) Disconnect the FFC (Full Flat Cable) ②.
  - c) Remove the cassette housing installation screws ③.
  - d) Slide and pull out the cassette housing control assembly ④ upward.

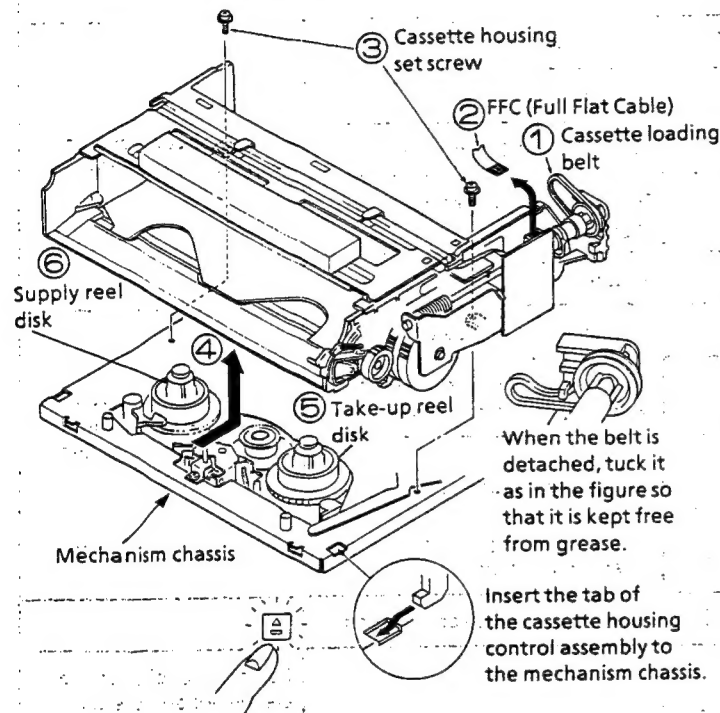


Figure 1-1.

### • Reassembly

1. Before installation of the cassette housing control assembly, place the unit in the stop mode with the power on, then unplug the power cord. (The main body is placed in the eject mode.)
2. Follow the procedures for removal in the reverse order.

### Notes:

1. Be sure to unplug the power cord in removal and reassembly.
2. Keep the cassette loading belt free from grease. In case of its adhesion, clean the belt.
3. In using a magnet screw driver, be sure to keep it away from the A/C head, FE (Full Erase) head, or the drum.

4. In removal and reassembly, take care not to hit the cassette housing control assembly or tools against the guide pin, drum, or the like thereabout.
5. Place the unit in the eject mode in removal or reassembly of the cassette housing control assembly.
6. Load the cassette once onto the cassette housing control assembly after reassembly. (If the cassette housing control assembly normally operates after this, the phases of mechanism and the cassette controller are accurately adjusted after ejection.)

## MECHANICAL OPERATION CHECK WITHOUT CASSETTE

When power is on, the general operations of the mechanism can be checked without a cassette. Note the following points.

1. Check video search rewind and rewind, rotating the take-up reel disk ⑤ by hand (in either normal or reverse direction). If it is not rotated, the reel sensor works to shift the mechanism to the eject mode.
2. When the stop button is pressed, the mechanism does not stop at a normal stop position. It shifts to the eject mode and stops.
3. When the stop button is pressed in the playback, video search rewind, and video search forward modes, the supply reel disk ⑥ keeps on rotating for several seconds for elimination of tape slack in the course of shifting to the eject mode. In such a case, rotate the take-up reel disk ⑤ somewhat by hand, and the supply reel disk ⑥ stops, which can reduce the working time.

## REPLACEMENT OF WORM WHEEL ASSEMBLY

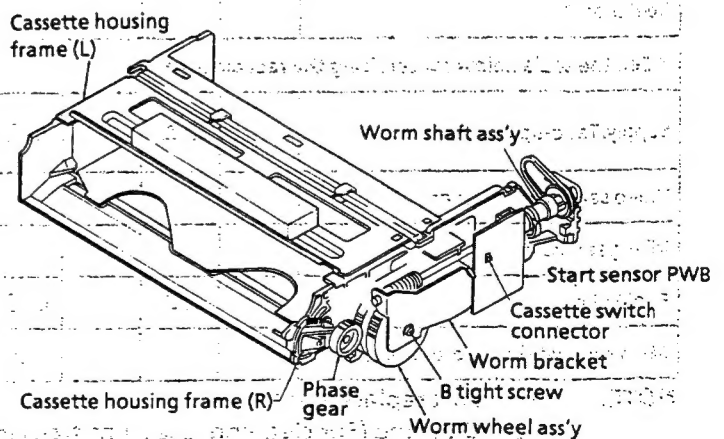


Figure 1-2.



### ● Removal

1. Unsolder the cassette switch connectors (No. 16, 17) from the start sensor PWB.

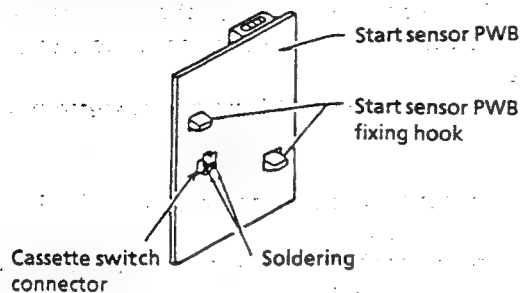


Figure 1-3.

2. Lift the start sensor PWB pressing the two start sensor PWB fixing hooks inward.

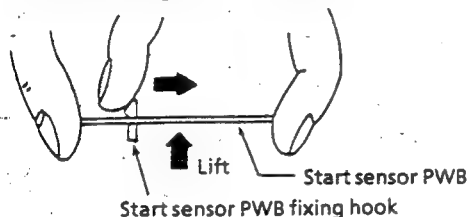


Figure 1-4.

3. Unscrew one B tight screw to detach the worm bracket.

### Note:

The worm shaft bearing can easily come out of position. So be careful not to lose it.

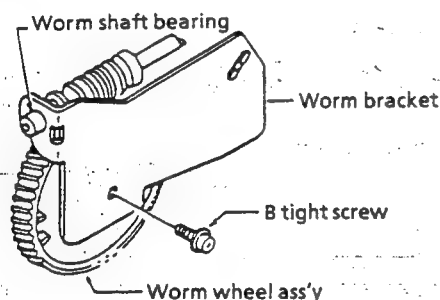


Figure 1-5.

4. Remove the worm shaft assembly, pulley, and cassette loading belt all from the cassette housing frame (R).

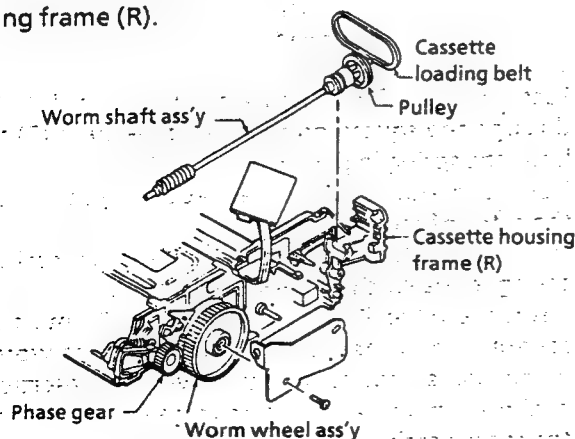


Figure 1-6.

5. Place the slider pin just above the worm wheel assembly (Figure 1-7). (The retainer of the slider is locked at two positions. So unlock it as in the Figure 1-8.)
6. Pull out the worm wheel assembly toward you pressing the switch lever upward. (Figure 1-7)

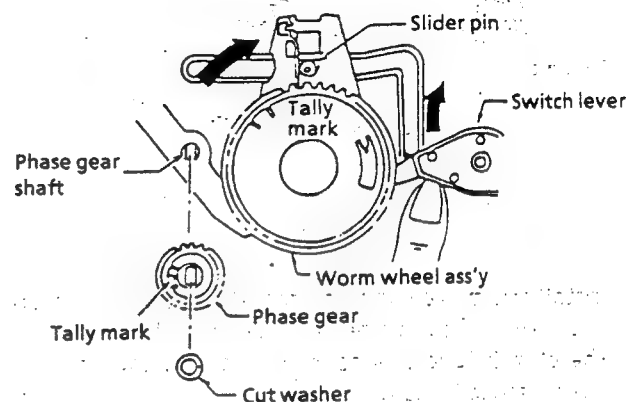


Figure 1-7.

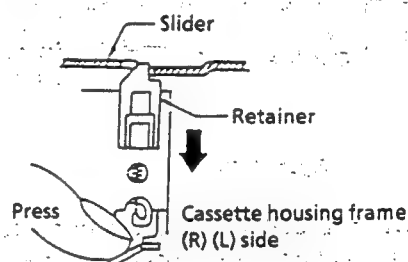
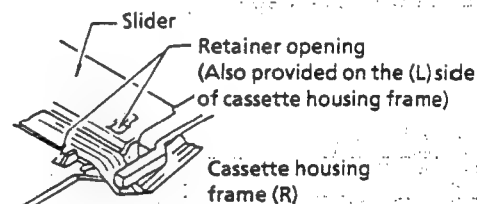


Figure 1-8.

### ● Reassembly

1. Turn the phase gear clockwise until the slider comes to a halt in the cassette insertion direction. (See the Figure 1-9.)
2. Insert the set up worm wheel gear assembly into the cassette housing frame (R), matching the mark on the phase gear with the mark on the worm wheel gear. Detach the cut washer on the phase gear assembly and the phase gear for easier installation of worm wheel assembly.

### Note:

Make sure that the slider pin is in the groove of the drive gear arm.

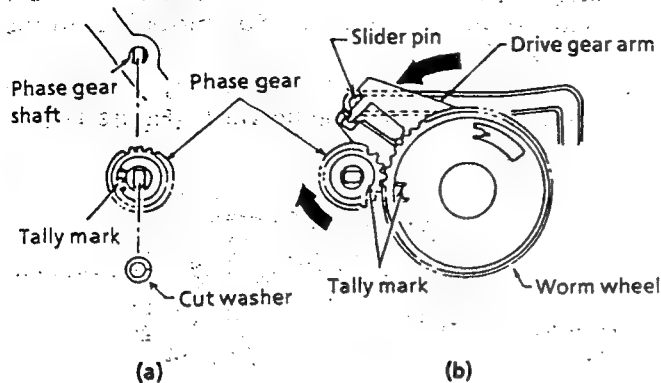


Figure 1-9.

3. Install the pulley and the cassette loading belt on the worm shaft assembly. Couple the clutch to the clutch lever. And mount them together in the cassette housing frame (R).

**Note:**

Keep in mind that the clutch switching lever should be in the correct position. The mechanism might malfunction if the lever is slightly out of position. (See page 13.)

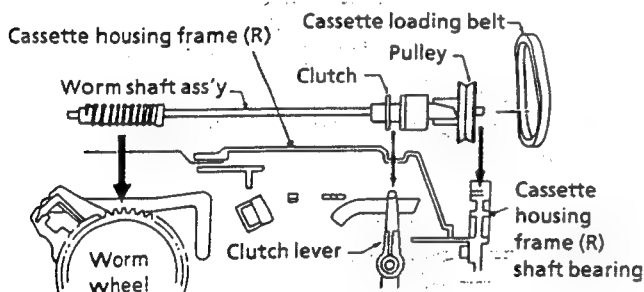


Figure 1-10.

4. Attach the worm bracket to the worm shaft assembly. Place them onto the boss on the cassette housing frame (R).

**Note:**

Insert ① before screwing into ② and ③.

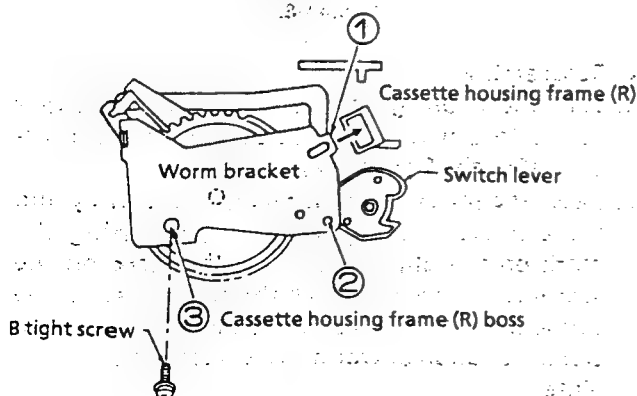


Figure 1-11.

5. Tighten one B tight screw.

**Note:**

Do not overtighten the B tight screw (no more than  $5.0 \pm 0.5$  kg.cm), because the lower threads of the screw hole at the resin-made boss can be broken.

6. Place the start sensor PWB on the cassette housing frame (R).

**Note:**

Check that the switch connectors (No. 16, 17) are in the cassette switch mounting hole.

7. Finally resolder the cassette switch connector to the start sensor PWB.

## REASSEMBLY OF DRIVE GEAR

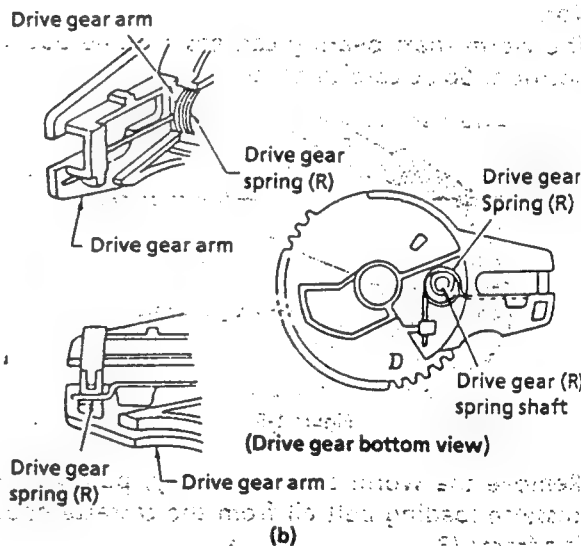
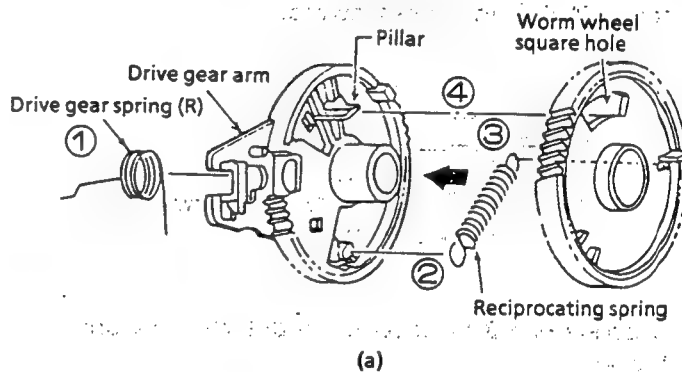


Figure 1-12.

1. Pass the tip of the drive gear spring (R) ① through the square hole of the drive gear (R) to hook the spring in position.
2. Hook one end ② of the reciprocating spring to the catch of the drive gear (R).
3. Hook the other end ③ of the reciprocating spring to the catch of the worm wheel.
4. Insert the pillar ④ of the drive gear (R) into the square hole of the worm wheel. Turn the worm wheel somewhat counterclockwise for insertion of the worm wheel to the drive gear (R), because the reciprocating spring is at work.

## REPLACEMENT OF CASSETTE LOADING BELT

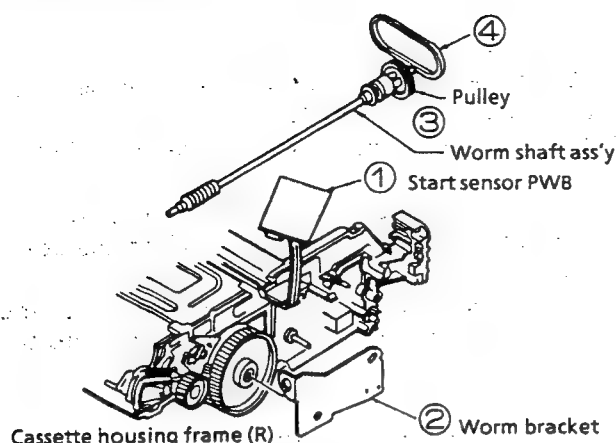


Figure 1-13.

1. Remove the start sensor PWB ① and worm bracket ② from the cassette housing frame (R).
2. Remove the worm shaft assembly ③.
3. Replace the cassette loading belt ④ with a new one.

### Notes:

1. Do not overtighten the B tight screw which holds the worm bracket in position. The specified torque is  $5.0 \pm 0.5 \text{ kg.cm}$ .
2. Make sure that the cassette loading belt is free from grease. If stained with grease, clean the belt with the cleaning liquid.
3. Perform checking of the clutch switch lever for proper action.

## CHECKING THE CLUTCH SWITCH LEVER

### ● Checking

Place the mechanism in the cassette eject mode when removing and attaching the cassette housing from and to the mechanism chassis. Make sure enough that each part in the cassette housing such as the clutch switch lever is in position. If not, it causes malfunction.

### Note:

Figure 1-14 shows the position of each part in the cassette eject mode.

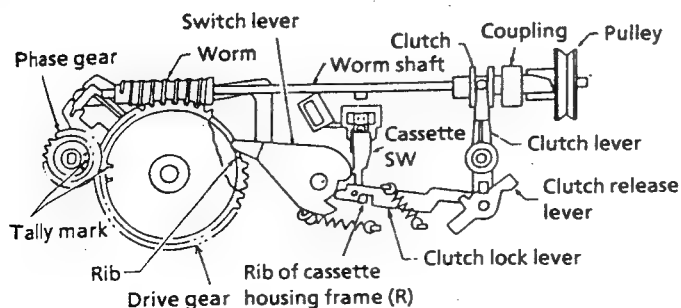
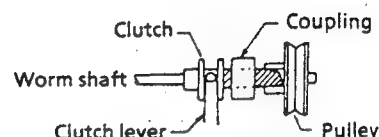


Figure 1-14.

1. First make sure that the tip of the switch lever is held at the rib of the drive gear (R).
2. Check that the rib of the cassette housing frame (R) and the concavity of the clutch lock lever are engaged.
3. Finally be sure that the relationship between the clutch lever and the clutch, as well as between the clutch and the pulley, are correct as in the Figure 1-15.



Check that the clutch is engaged with the pulley through the coupling.

Figure 1-15.

### ● Resetting

Take the following steps to reset the clutch if it is unlocked or if the switch lever and the clutch lock lever are unlocked.

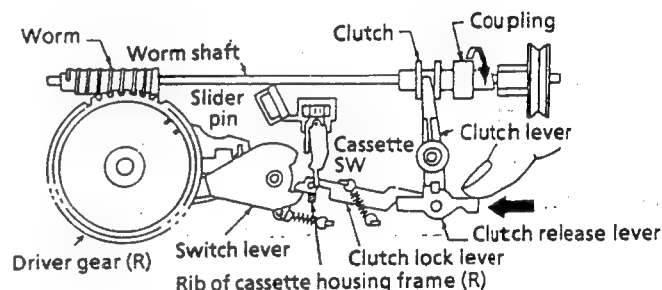


Figure 1-16.

1. Shift the slider by turning the coupling in the arrow direction (clockwise) until the slider pin is at the bottom of the slider groove as shown in the Figure 1-16. (The loading mode)

### Note:

Note that the slider is equipped with a lock mechanism. Unlock the locks on cassette housing frames (L) and (R) side before shifting the slider.

2. When the position is set as shown in the Figure 1-16, push the clutch release lever in the direction of the arrow by hand until the clutch lock lever becomes tightly locked by the rib of the cassette housing frame (R).
3. Then turn the coupling counterclockwise until the slider reaches the cassette insertion opening and the reciprocating spring is activated.

### Note:

There is no need to unlock the slider when shifting the slider to the cassette insertion opening. Just keep shifting the slider.

## REPLACEMENT OF LOCK RELEASE LEVER

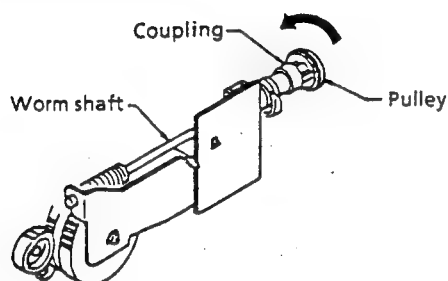
### ● Removal

1. Place the slider in the cassette down position.  
(Turn the coupling on the worm shaft clockwise until the slider is in the cassette down position.)

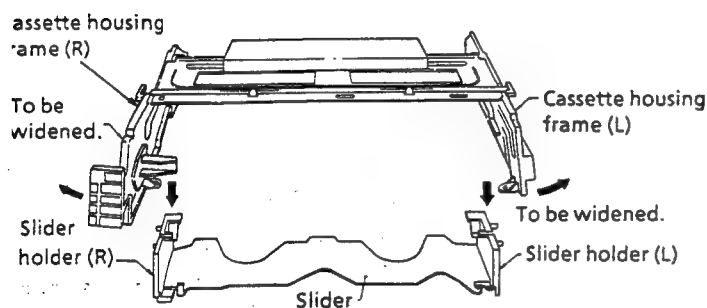
#### Note:

Before shifting, unlock the slider.

2. Slightly widen the cassette housing frames (R) and (L) to unhook the slider holders (R) and (L) of the slider assembly off the grooves of the cassette housing frames.



(a)



(b)

Figure 1-17.

3. Lift the slider holder (R) upward about 2mm off the slider by pressing two catches with a thin tip screw driver. Take care not to damage the catches.

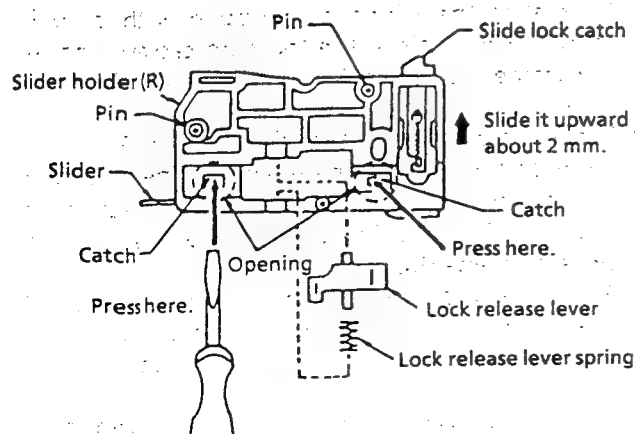


Figure 1-18.

4. Remove the lock release lever from the slider holder (R)

### ● Reassembly

1. Follow the steps for removal in the reverse order.  
(See Figures 1-17 and 1-18.)
2. Attach the lock release lever to the slider holder (R).
3. Slide the slider holder (R) downward so that the two catches of the slider holder (R) fit the opening of the slider.
4. Slightly widen the cassette housing frames, and set the pins of slider holders (R) and (L) into the grooves of the cassette housing frames.

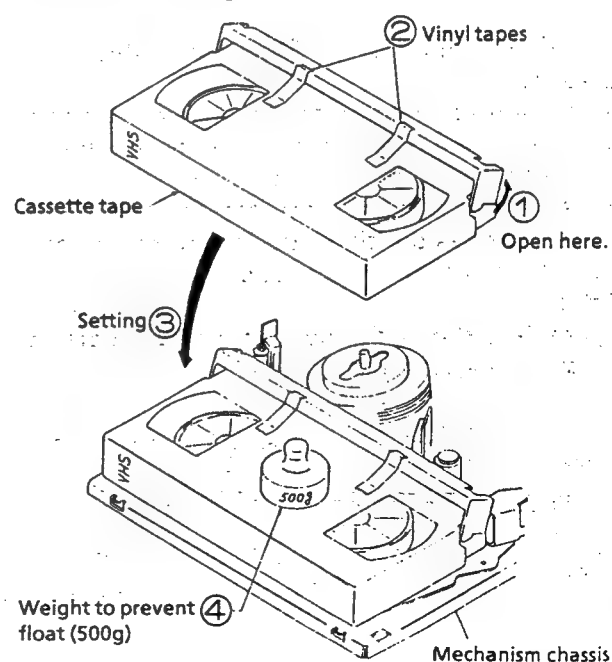
#### Note:

Check if the pins of the slider holders (R) and (L) fit the grooves of the cassette housing frames, and if the drive gear arm is sufficiently engaged with the slider holders.

5. Turn the coupling counterclockwise until the slider is at the cassette insertion opening.

## TO RUN A TAPE WITHOUT THE CASSETTE HOUSING CONTROL ASSEMBLY

1. Plug in the power cord.
2. Turn on the power switch.
3. Open the lid ① of a cassette tape by hand.
4. Hold the lid with two pieces of vinyl tape ②.
5. Set the cassette tape in the mechanism chassis.
6. Weight the cassette tape with a weight ④ to prevent floating.
7. Perform running test.



#### Note:

The weight should not be more than 500 g.

Figure 1-19.

## REPLACEMENT AND HEIGHT CHECKING AND ADJUSTMENT OF REEL DISKS

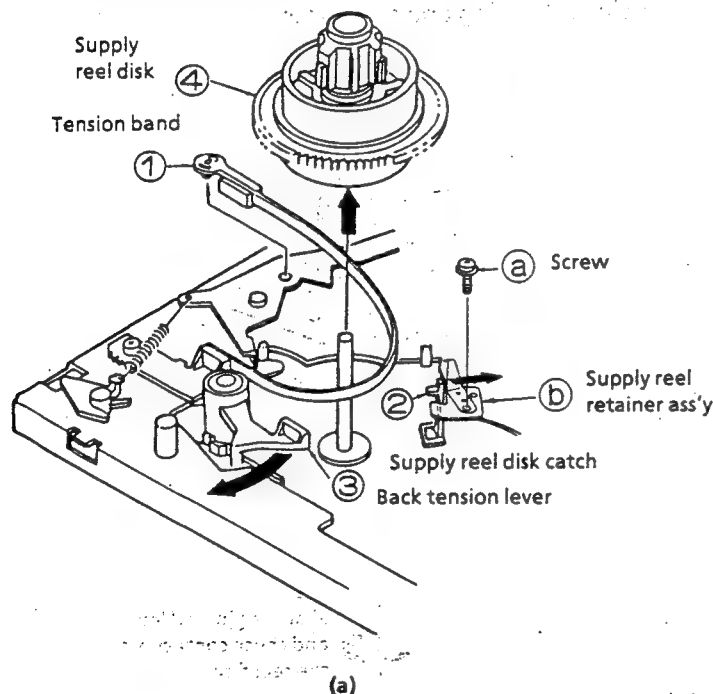
1. Remove the cassette housing control assembly.
2. Set the mechanism in the playback mode with no cassette tape in place. Unplug the power cord.
3. Set the idler gear in the center (neutral).

### ● Removal (Supply reel disk)

1. Remove the tension band ①. (Take care not to deform it.)
2. Unscrew the screw ③ and remove the supply reel retainer assembly ⑤.
3. Release the supply reel disk catch ② and back tension lever ③.
4. Pull the supply reel disk ④ upward.

#### Notes:

1. Take care not to deform the tension band.
2. Check and adjust the tension pole position. (See page 20.)
3. Be careful not to damage the gear and the idler gear on the supply reel disk.
4. Press the tension band in the direction of the arrow for removal (See Figure 1-20(b)).



#### Note:

When the tension band is pressed in the direction of the arrow for removal, the catch is hard to be deformed.

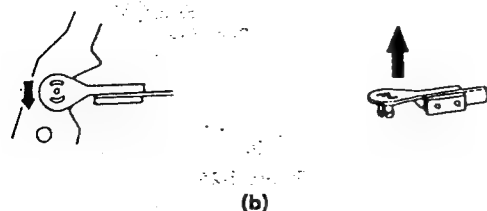


Figure 1-20.

### ● Removal (Take-up reel disk)

1. Unscrew the screw ③ and remove the take-up reel retainer.
2. Release the take-up reel disk catch ①.
3. Pull the take-up reel disk ② upward.

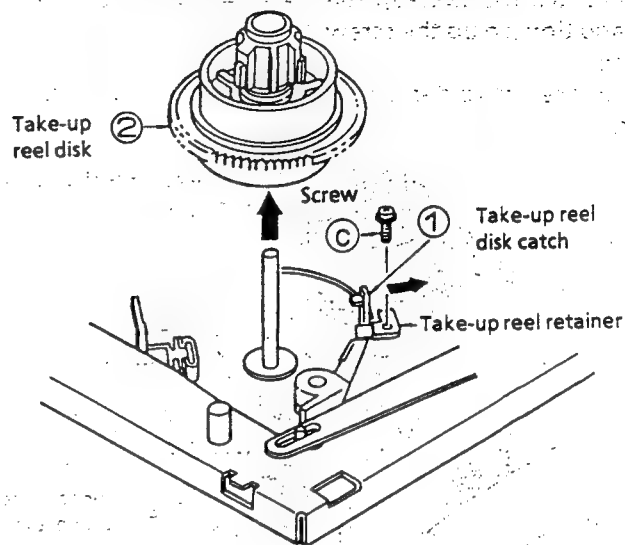


Figure 1-21.

### ● Reassembly (Supply reel disk)

1. Clean the reel disk shaft ① and apply oil to it.
2. Release the supply reel disk catch ② and back tension lever ③.
3. Install a new supply reel disk ④ onto the shaft.
4. Replace the tension band ⑤ around the supply reel disk, and insert it to the hole of the tension arm.
5. Replace the supply reel retainer assembly ⑥ in place, and tighten up the screw ③.

#### Notes:

1. Take enough care not to deform the tension band during installation of the supply reel disk.
2. Be careful not to damage the supply reel disk gear, back tension lever, supply reel disk catch, or the like with tools.

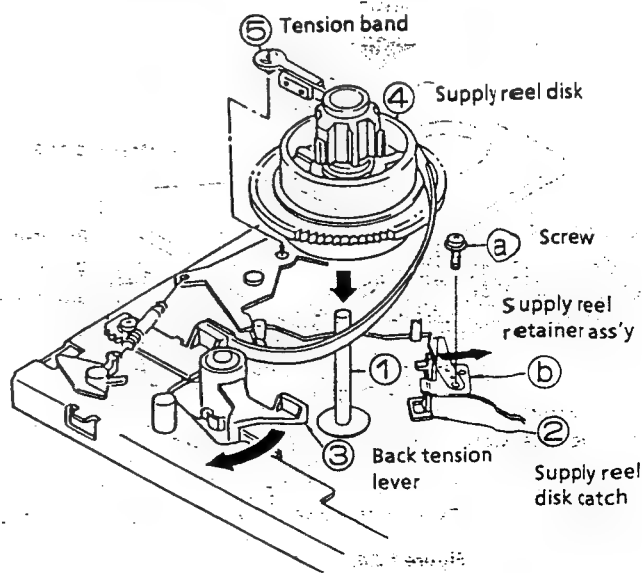


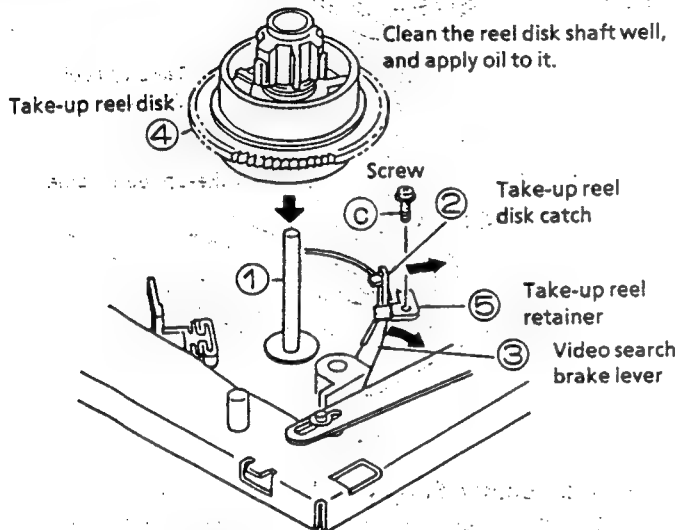
Figure 1-22.

# ● Reassembly (Take-up reel disk)

1. Clean the reel disk shaft ① and apply oil to it.
2. Release the take-up reel catch ② and video search brake lever ③.
3. Install a new take-up reel disk ④ onto the shaft.
4. Replace the take-up reel retainer ⑤ in position and tighten up the screw ⑥.

## Note:

Take care not to damage the video search brake lever.



Apply a thin tip driver to the arrow position in releasing for easier setting of the take-up reel disk.

Figure 1-23.

- \* After reassembly, check the video search rewind back tension (see page 19), and check the brake torque (see page 21).

# ● Height checking and adjustment

## Note:

Place the master plane onto the mechanism unit, taking care not to hit the drum (see Figure 1-24).

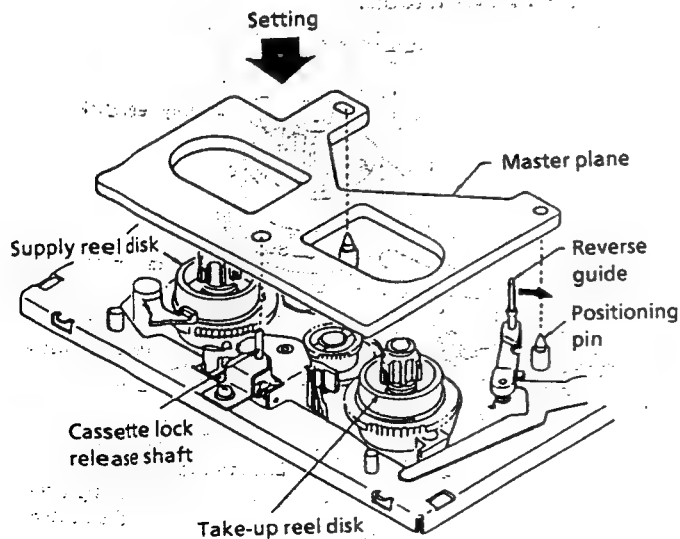


Figure 1-24.

1. For height adjustment, press the reel disk with a finger, and turn it right and left with a screwdriver (see Figure 1-26 (a)).

Set the master plane releasing the reverse guide by a finger.

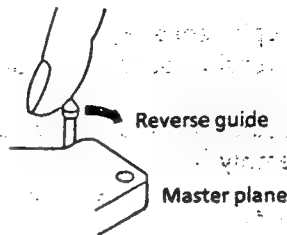
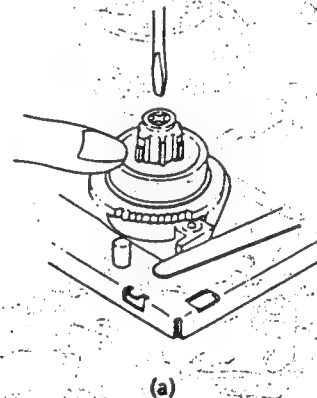


Figure 1-25.

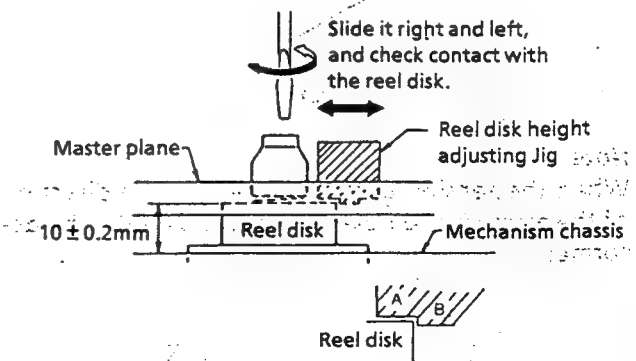
2. Check that the reel disk is lower than part A but higher than part B. If the height is not correct, adjust the height adjusting screw (see Figure 1-26 (b)).

## Note:

Whenever replacing the reel disk, perform the height checking and adjustment.



(a)



(b)

Figure 1-26.



## CHECKING AND ADJUSTMENT OF TAKE-UP TORQUE IN FAST FORWARD MODE

- Remove the cassette housing control assembly.
- Setting

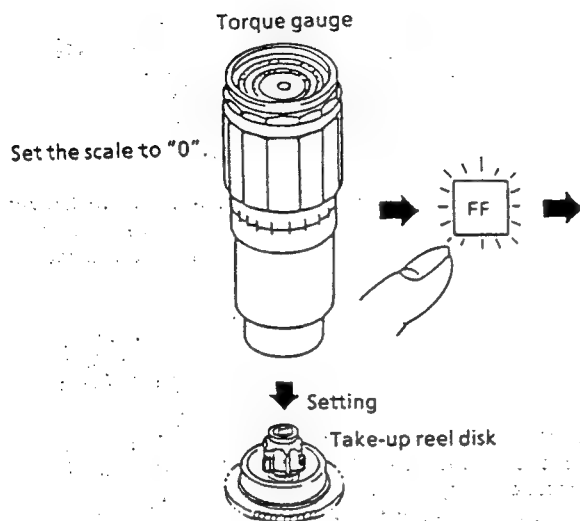


Figure 1-27.

- Checking

Turn the torque gauge slowly (one rotation every 2 to 3 seconds) by hand in the take-up direction

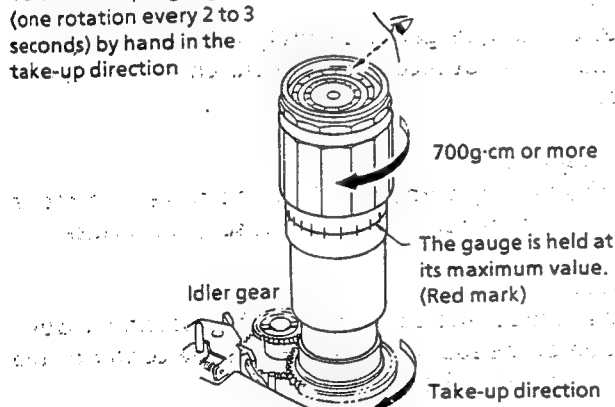


Figure 1-28.

- Adjustment

1. If the take-up torque is outside the range, clean the capstan D.D. motor pulley, reel belt and reel pulley with cleaning liquid, then recheck the torque.
2. If the take-up torque is still out of range, replace the reel belt.

### Notes:

1. Hold down the torque gauge so that it may not fly off.
2. When checking the take-up torque, do not keep the reel disk locked for a longer time.

## CHECKING AND ADJUSTMENT OF TAKE-UP TORQUE IN REWIND MODE

- Remove the cassette housing control assembly.
- Setting

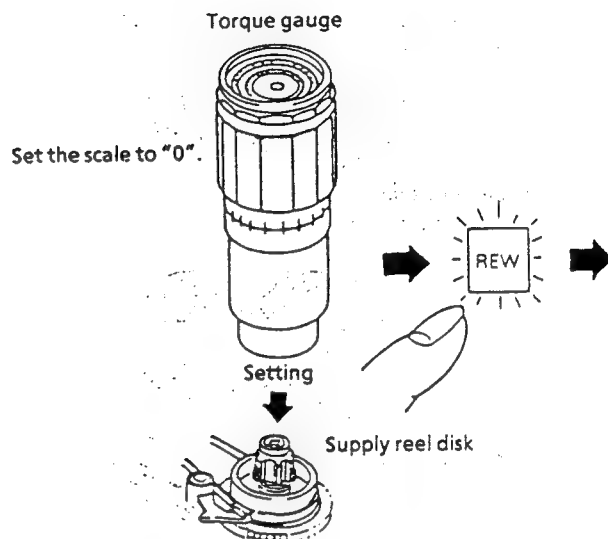


Figure 1-29.

- Checking

Turn the torque gauge slowly (one rotation every 2 to 3 seconds) by hand in the take-up direction

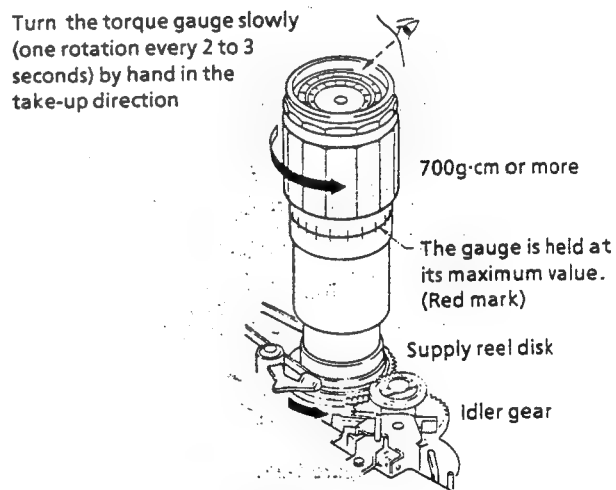


Figure 1-30.

- Adjustment

1. If the take-up torque is outside the range, clean the capstan D.D. motor pulley, reel belt and reel pulley with cleaning liquid, then recheck the torque.
2. If the take-up torque is still out of range, replace the reel belt.

### Notes:

1. Hold down the torque gauge so that it may not fly off.
2. When checking the take-up torque, do not keep the reel disk locked for a longer time.

## CHECKING AND ADJUSTMENT OF TAKE-UP TORQUE IN PLAYBACK MODE

1. Remove the cassette housing control assembly.
2. Open the lid of the cassette torque meter, and hold it with two pieces of vinyl tape.

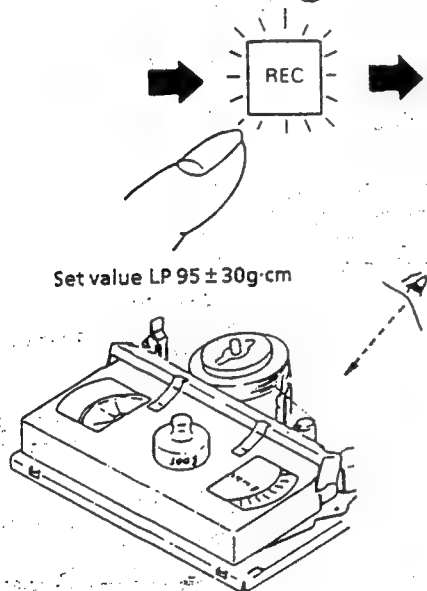
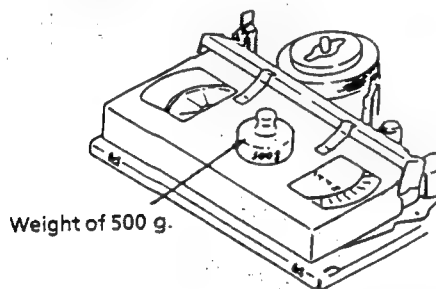
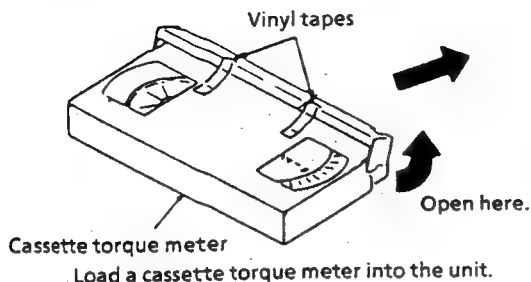


Figure 1-31.

### ● Checking

1. Check that the torque is in the range of  $95 \pm 30 \text{ g}\cdot\text{cm}$ .
2. The torque fluctuates due to the rotational deviation of the reel drive unit. Use the center of the fluctuation as the value.
3. Place the unit in the LP record mode, and check that the take-up torque is within the range.

### ● Adjustment

If the take-up torque in the playback mode is outside the range, replace the take-up reel disk.

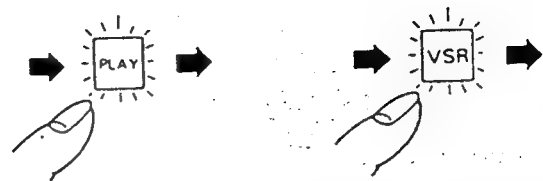
#### Note:

Weight the cassette torque meter to prevent floating.

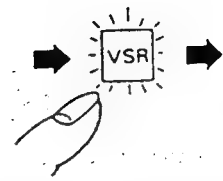
## CHECKING AND ADJUSTMENT OF TAKE-UP TORQUE IN VIDEO SEARCH REWIND MODE

- Remove the cassette housing control assembly.

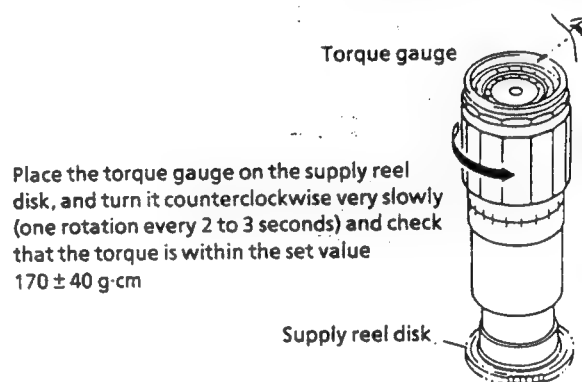
### ● Checking



Push the play button to place the unit in the playback mode.



Push the video search rewind button to place the unit in the video search rewind mode.



Place the torque gauge on the supply reel disk, and turn it counterclockwise very slowly (one rotation every 2 to 3 seconds) and check that the torque is within the set value  $170 \pm 40 \text{ g}\cdot\text{cm}$

Figure 1-32.

#### Note:

Set the torque gauge securely on the supply reel disk. If it is not secure, the measurement will be incorrect.

### ● Adjustment

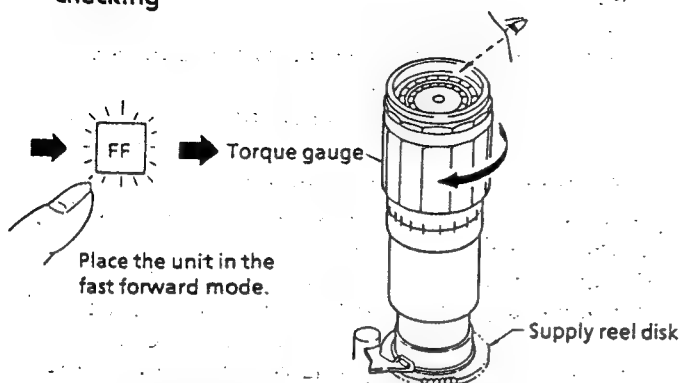
If the take-up torque in video search rewind mode is outside the range, replace the supply reel disk.

#### Note:

The torque fluctuates due to the rotational deviation of the supply reel disk. Use the center of the fluctuation at the value.

## CHECKING THE FAST FORWARD BACK TENSION

- Remove the cassette housing control assembly.
- Checking



Place the unit in the fast forward mode.

Place the torque gauge on the supply reel disk, and turn it clockwise very slowly (one rotation every 2 to 3 seconds) and check that the torque is within  $15 \pm 5$  g-cm

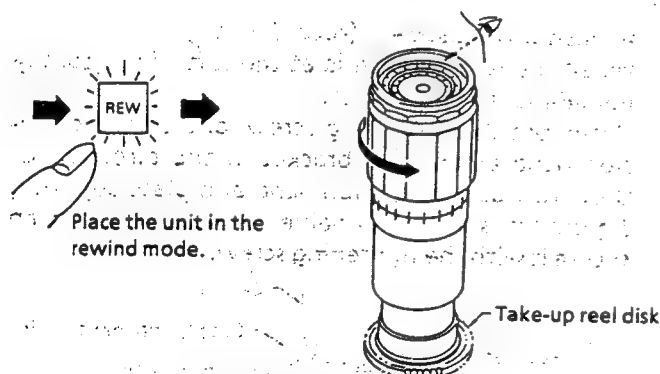
Figure 1-33.

### Note:

Set the torque gauge securely on the supply reel disk. If the torque gauge is not securely set on the reel disk, measurement will be incorrect.

## CHECKING THE REWIND BACK TENSION

- Remove the cassette housing control assembly.
- Checking



Place the unit in the rewind mode.

Place the torque gauge on the take-up reel disk, and turn it counterclockwise very slowly (one rotation every 2 to 3 seconds) and check that the torque is within  $15 \pm 5$  g-cm.

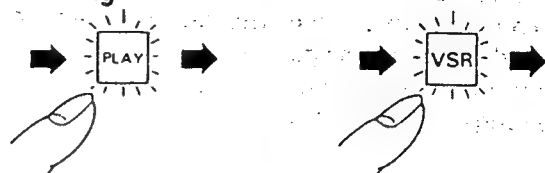
Figure 1-34.

### Note:

Set the torque gauge securely on the take-up reel disk. If it is not secure, the measurement will be incorrect.

## CHECKING THE VIDEO SEARCH REWIND BACK TENSION

- Remove the cassette housing control assembly.
- Checking



Push the play button to place the unit in the playback mode.

Push the video search rewind button to place the unit in the video search rewind mode.

Place the torque gauge on the take-up reel disk, and turn it counterclockwise very slowly (one rotation every 2 to 3 seconds) and check that the torque is within the set value  $45 \pm 20$  g-cm.

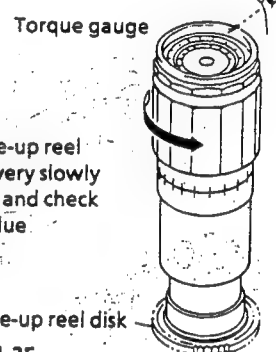


Figure 1-35.

### Note:

Set the torque gauge securely on the take-up reel disk. If it is not secure, the measurement will be incorrect.

## CHECKING THE PINCH ROLLER PRESSURE

- Remove the cassette housing control assembly.

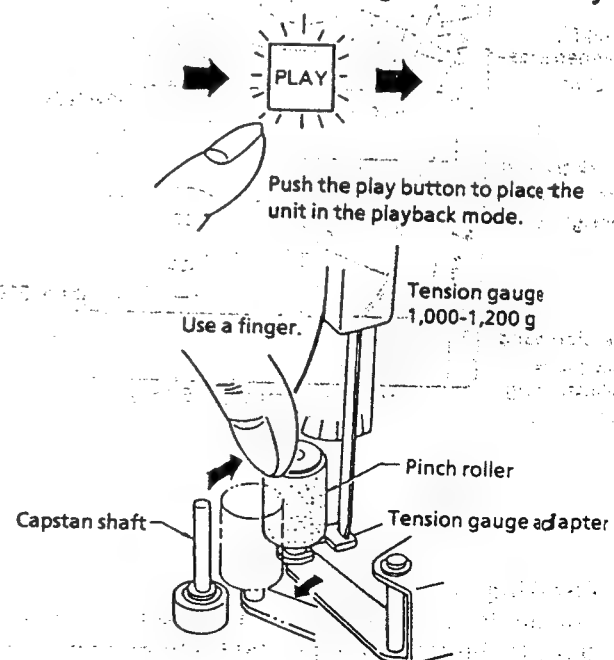


Figure 1-36.

1. Detach the pinch-roller from the capstan shaft.
2. Set the tension gauge by hooking the tension gauge adapter onto the pinch roller shaft.
3. Gradually release the pressure to allow the pinch roller to touch the capstan shaft. When the pinch roller just touches the capstan shaft, read the indication on the gauge.
4. Check that the reading of the tension gauge is in the range of 1000 to 1200 g.

## CHECKING AND ADJUSTMENT OF TENSION POLE POSITION

- Remove the cassette housing control assembly.

### • Setting

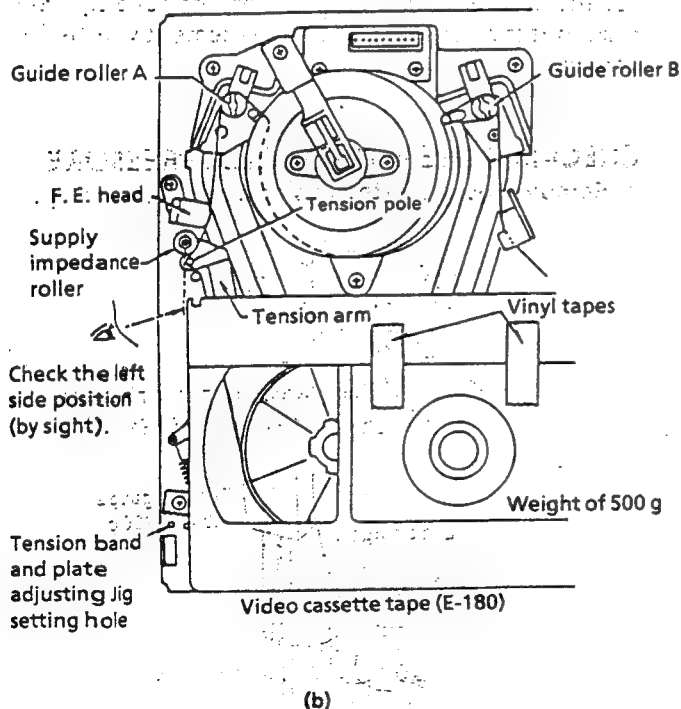
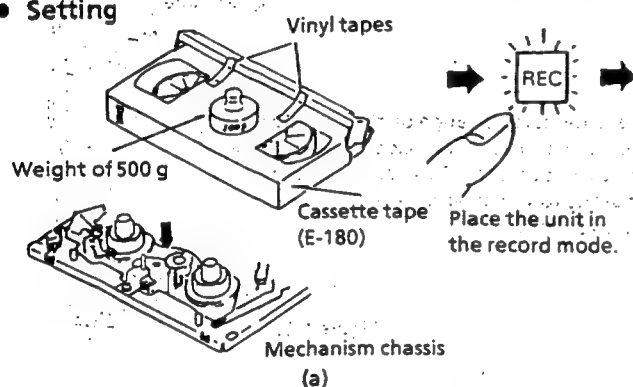


Figure 1-37.

### • Checking

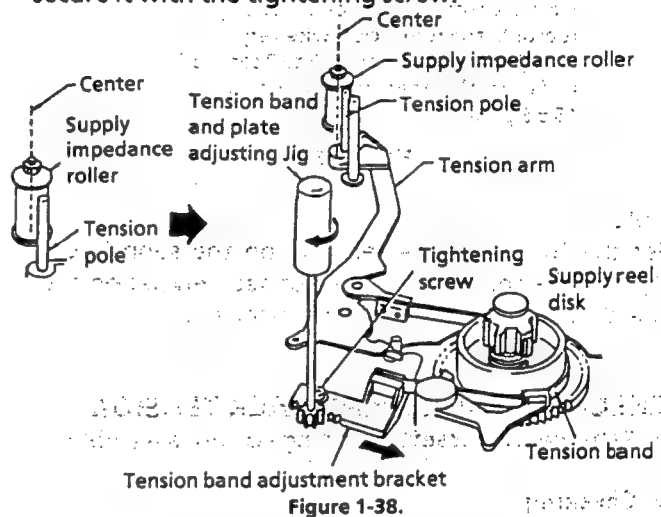
1. The guide rollers (A, B) operate to bring the tape outside the cassette tape and simultaneously the tension pole moves to the left, loading the tape. At that time (loading completed), check the position of the tension pole.

2. At the beginning of the tape (E-180), check that the tension pole's left side is aligned with the supply impedance roller's center by sight.
3. Check that the end of the tape is neither curled against the flange of the supply impedance roller nor over it.
4. During the video search rewind mode with no cassette tape in place, check that the supply reel disk is free from the tension band.

### • Position adjustment (record mode)

When the tension pole is at the right of the supply impedance roller's center:

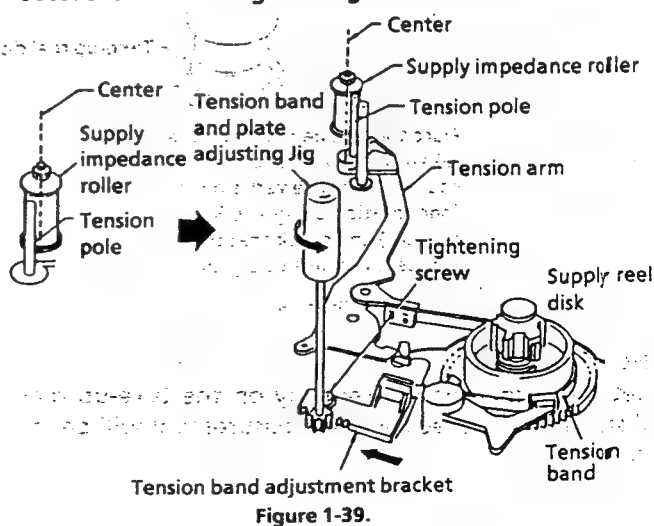
Untighten the tightening screw, and shift the tension band adjustment bracket in the direction of the arrow using a tension band and plate adjusting Jig until it is in the set value range (center). Then secure it with the tightening screw.



### • Position adjustment (record mode)

When the tension pole is at the left of the supply impedance roller's center:

Untighten the tightening screw, and shift the tension band adjustment bracket in the direction of the arrow using a tension band and plate adjusting Jig until it is in the set value range (center). Then secure it with the tightening screw.



## CHECKING AND ADJUSTMENT OF RECORD / PLAYBACK BACK TENSION

- Remove the cassette housing control assembly.

### • Checking

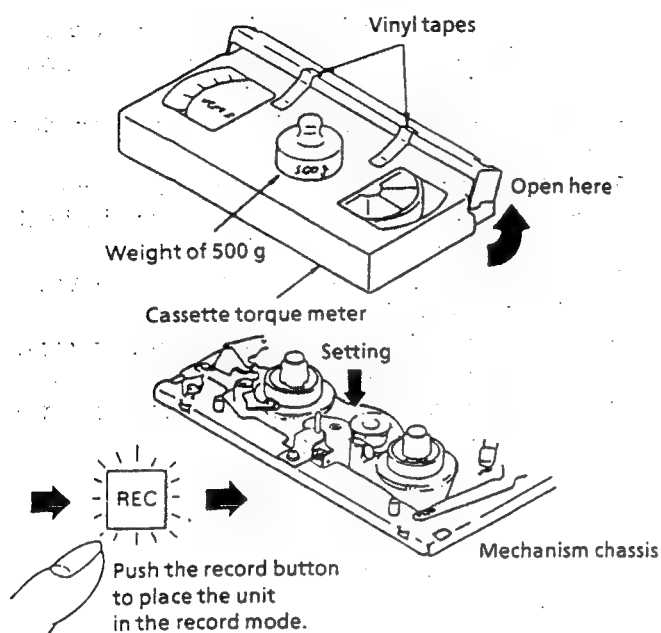


Figure 1-40.

1. Put a cassette torque meter into the unit.
2. Push the record button to place the unit in the record mode.
3. Check that the back tension indicated by the gauge is within the set range 31 to 36 g-cm.

#### Notes:

1. Make sure that the video cassette tape is over the retaining guide.
2. Make sure that the tape is not slack nor damaged at either end.

### • Adjustment

1. If the reading of the cassette torque meter is less than specified, move the tip of the tension spring hook plate toward the hole A.
2. If the reading of the cassette torque meter is more than specified, move the tip of the tension spring hook plate toward the hole B.

#### Note:

Put a thin screw driver (–) in the shaft hole, lean it toward you, and turn it for easier shift of the tension spring hook plate in the direction of A or B.

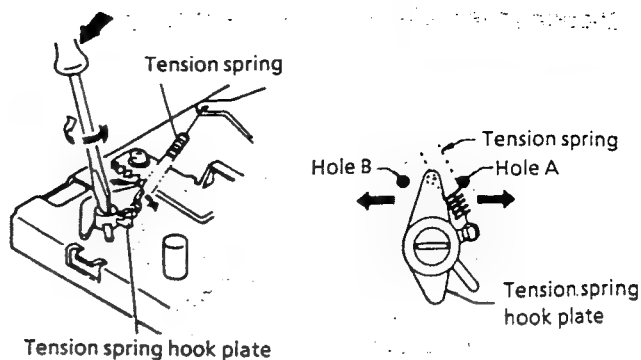


Figure 1-41.

## CHECKING THE BRAKE TORQUE

- Checking the brake torque at the supply side

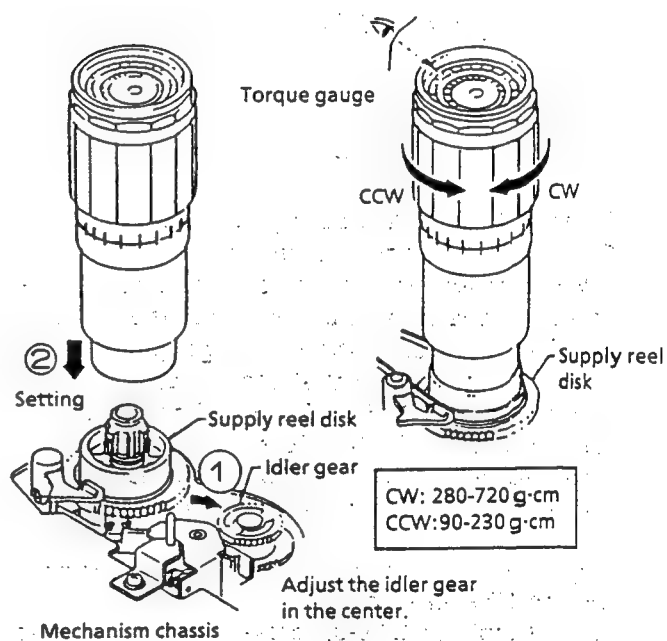


Figure 1-42.

1. Remove the cassette housing control assembly.
2. Place the mechanism in the stop mode by unplugging the power cord in the fast forward or rewind mode.
3. Slowly rotate the torque gauge in the clockwise (CW) direction and counterclockwise (CCW) direction of the supply brake so that the reel disk and the indicator of the torque gauge rotate at an equal rate. Check that the values are within the range of CW direction = 280 to 720 g-cm, CCW direction = 90 to 230 g-cm, and that the brake torque in the CW direction is at least twice as high as that in the CCW direction.

• Checking the brake torque at the take-up side

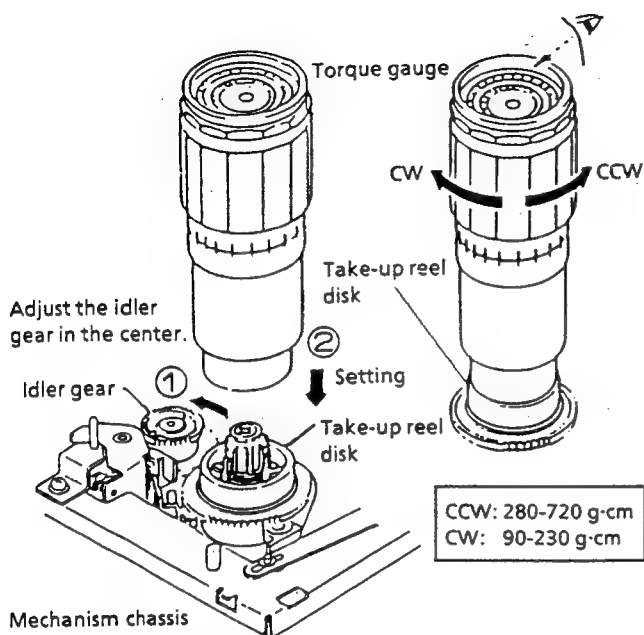


Figure 1-43.

1. Remove the cassette housing control assembly.
2. Slowly rotate the torque gauge in the clockwise (CW) direction and counterclockwise (CCW) direction of the take-up brake so that the reel disk and the indicator of the torque gauge rotate at an equal rate. Check that the values are within the range of CCW direction = 280 to 720 g·cm, CW direction = 90 to 230 g·cm, and that the brake torque in the CCW direction is at least twice as high as that in the CW direction.

• Adjustment of the brake torque at the supply side and the take-up side

1. If the supply or take-up brake torque is outside the range, clean the supply or take-up reel disk break lever felt, then recheck the torque.
2. If the supply or take-up brake torque is still outside the range, replace the main brake or the main brake spring.

## REPLACEMENT OF MAIN BRAKE

1. Remove the reel belt and the reel block FFC (Full Flat Cable).
2. Remove the cut washer ① off the brake shifter.
3. Unscrew the four screws ② and then the take-up reel retainer.
4. Remove the reel block assembly ④ downward.
5. Remove the cut washer ③ first and then the reel pulley.
6. Unscrew the two screws ④ and detach the idler assembly.
7. Unhook the back tension lever spring ⑤ and remove the back tension lever ⑥. (Undo the hook under the reel chassis.)
8. Open the shifter latch ⑦ and remove the brake shifter assembly ⑧.
9. Release the reel disk catches ⑬ and then remove the left and right reel disk assemblies ⑨ and ⑩.
10. Finally remove the main brake levers ⑪ and the main brake spring ⑫.

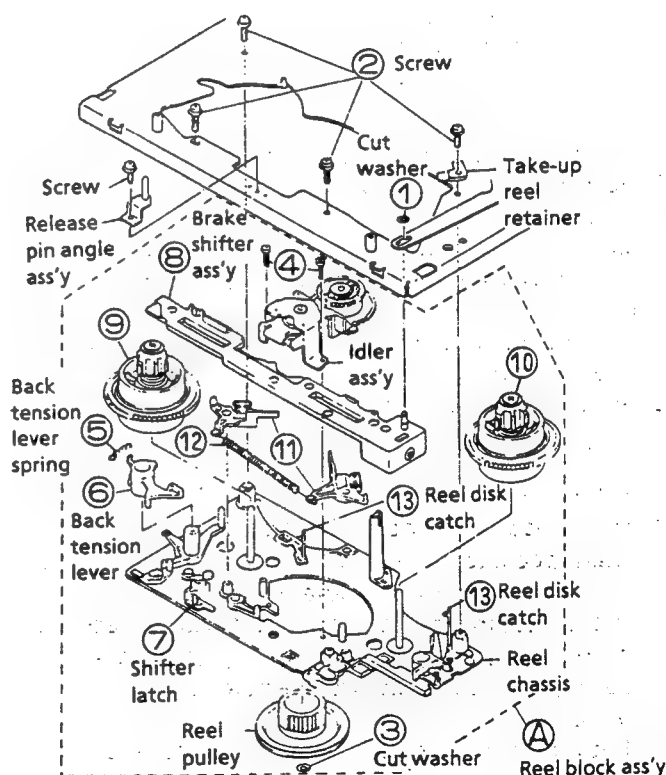


Figure 1-44.

**Note:**

When the main brake is replaced, perform the height checking and adjustment (see page 16), and the brake torque checking (see page 21).



## REPLACEMENT OF A/C (Audio/Control) HEAD

1. Remove the cassette housing control assembly.
2. Place the unit in the unloading mode, and unplug the power cord.

### ● Removal

1. Loosen the tilt adjusting screw ①.
2. Remove the azimuth adjusting screw ②.
3. Remove the A/C head screw ③.
4. Unsolder the A/C head PWB soldered to the A/C head assembly.

### Notes:

1. After replacement, be sure to perform the adjustment of the tape drive train (see page 25). Under any circumstances, avoid touching the head. Clean the head, if touched with your finger, with alcohol.
2. Take care that the azimuth spring does not fly off when removing the A/C head screw.

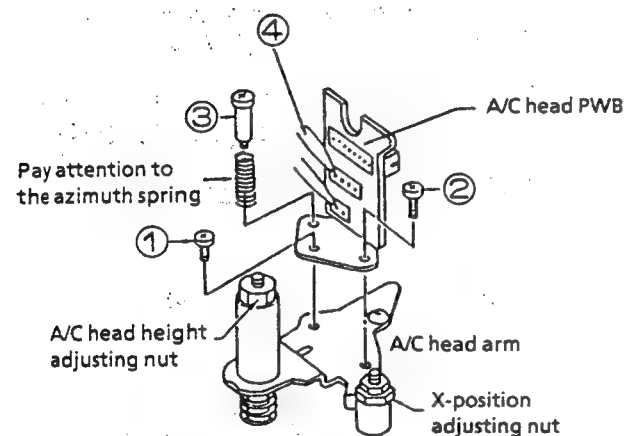


Figure 1-45.

### ● Replacement

1. Solder the removed A/C head PWB onto a new A/C head assembly.
2. The A/C head assembly is attached so that the A/C head arm and A/C head plate are roughly parallel to each other.

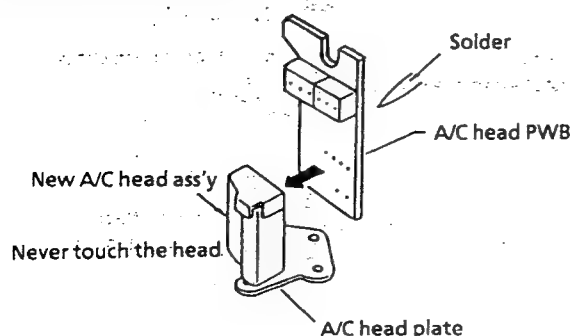


Figure 1-46.

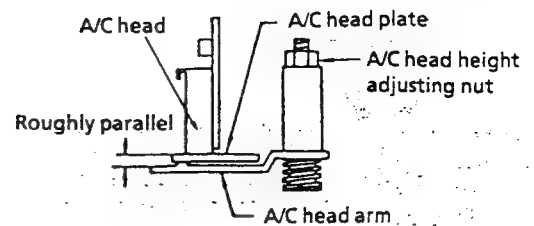
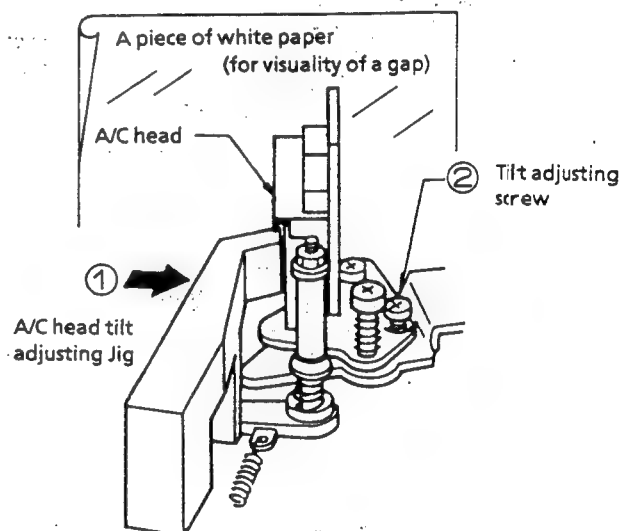


Figure 1-47.

### ● Adjustment

#### [A/C head tilt angle]

1. Set the mechanism to the loading mode.
2. Place the A/C head tilt adjusting Jig ①.
3. Slowly turn the tilt adjusting screw ② with a screw driver until there is no gap between the Jig and the A/C head.



(a)

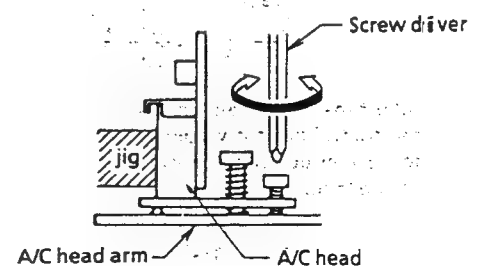
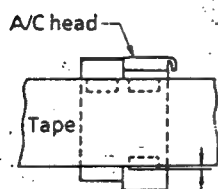
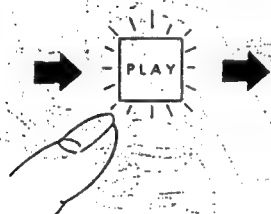
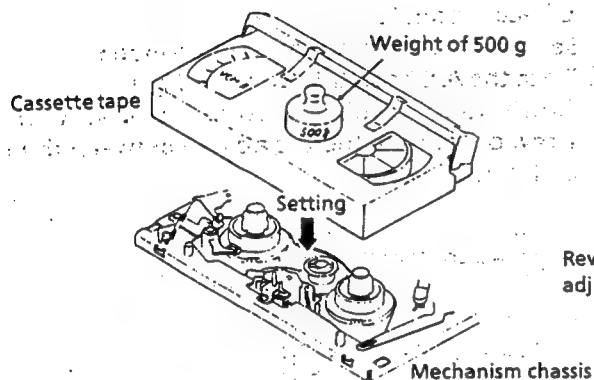
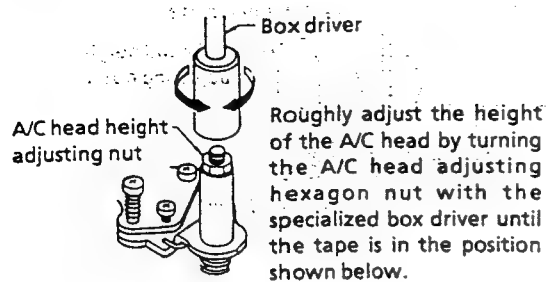


Figure 1-48.

## [A/C head height rough adjustment]



Adjust the nut visually so that the control head is visible 0.3 to 0.5 mm below the bottom of the tape.

Figure 1-49.

## [Height adjustment of retaining guide]

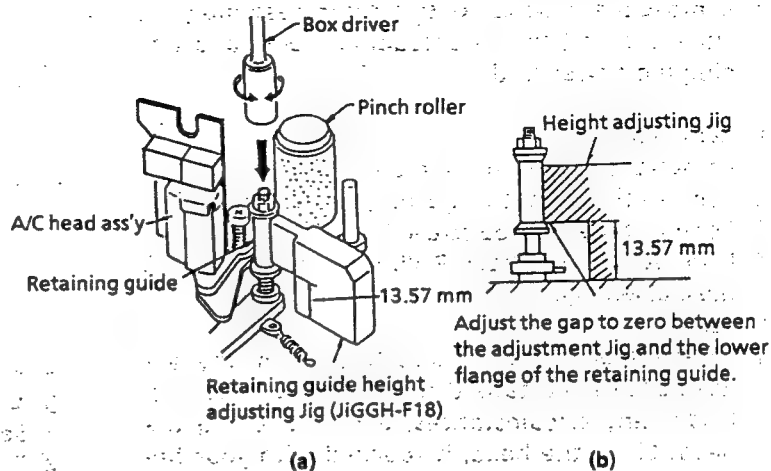
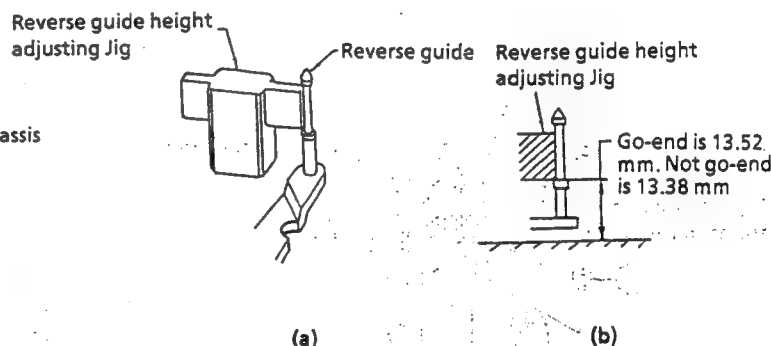
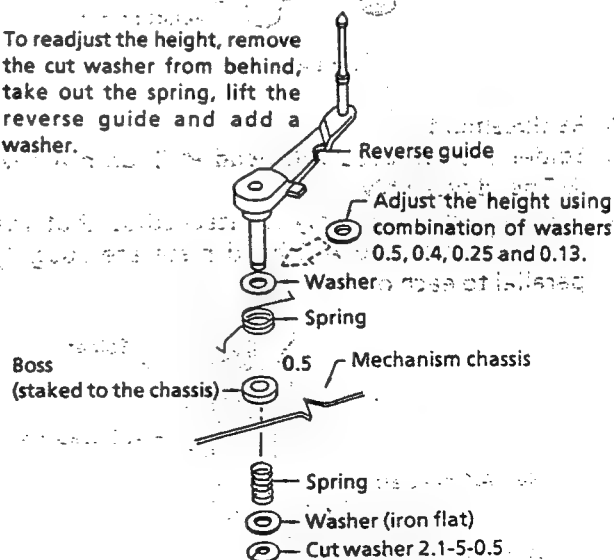


Figure 1-50.

## [Height adjustment of reverse guide]



To readjust the height, remove the cut washer from behind, take out the spring, lift the reverse guide and add a washer.



(c)

Figure 1-51.

## HEIGHT ADJUSTMENT OF RETAINING GUIDE AND REVERSE GUIDE

### Note:

Before the rough adjustment of the tape drive train, check that the retaining guide height is within the value in Figure 1-50 by using the special Jigs.

## ADJUSTMENT OF TAPE DRIVE TRAIN

1. Remove the cassette housing control assembly.
2. Check and adjust the position of the tension pole. (See page 20.)
3. Check and adjust the video search rewind back tension. (See page 19.)
4. Set the tilt angle of the A/C head. (See page 23.)
5. Rough adjustment of tape drive train.
  - a) Connect the oscilloscope to the test point for PB CHROMA envelope output (TP2201). Set the synchronism of the oscilloscope to EXT. The PB CHROMA signal is to be triggered by the head switching pulse (TP2202).
  - b) Loosen the setscrew at the lower part of the guide roller, and adjust it with an adjusting screw driver (JIGDRIVERH-4) so that the guide roller turns smoothly. (Do not overloosen the setscrew, which causes insecurity of the guide roller.) (See Figure 1-52.)
  - c) Set the alignment tape (monoscope pattern) on the reel disk, and place the unit in the playback mode. (Place a 500 g. weight on the cassette tape to prevent floating of the cassette tape.)

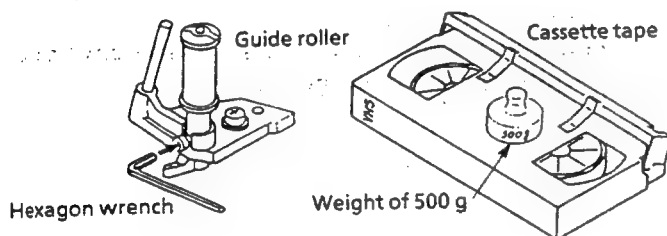
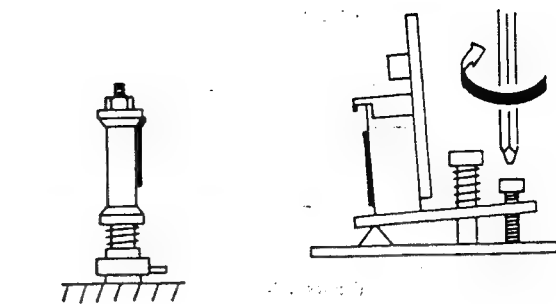


Figure 1-52.

Figure 1-53.

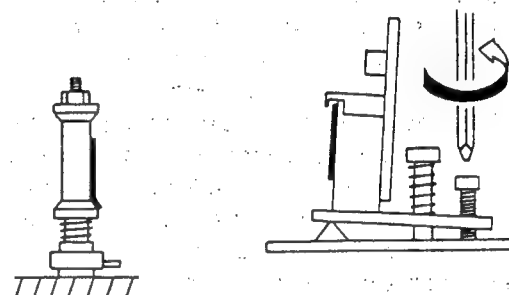
- d) Change the envelope waveform from MAX to MIN, and MIN to MAX by pushing the (+) or (-) tracking button, and check a flat response is obtained on the waveform.
- e) If a flat response cannot be obtained, roughly adjust the guide rollers on the supply side and take-up side using an adjusting screw driver until a flat response can be obtained.
- f) Turn the A/C head tilt adjusting screw with a screwdriver to prevent the tape from wrinkling at the upper and lower flanges of the fixed guide.
  - 1) Wrinkles at the upper flange : Turn the above adjusting screw clockwise, as shown in Fig. 1-54 (a).
  - 2) Wrinkles at the lower flange : Turn the above adjusting screw counterclockwise, as shown in Fig. 1-54 (b).



Wrinkles at upper flange

Clockwise

(a)



Wrinkles at lower flange

Counterclockwise

(b)

Figure 1-54.

### Notes:

1. Place the tracking control in the center position, and adjust the X-position adjusting nut so that the PB CHROMA envelop becomes maximum for easier rough adjustment of the tape drive train.
2. In the rough adjustment, pay particular attention to the outlet side.



Figure 1-55.

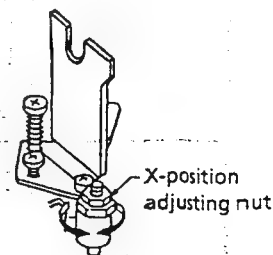


Figure 1-56.

PB CHROMA envelope (TP2201)

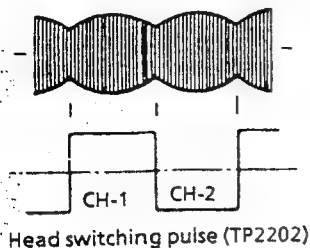


Figure 1-57.

# 6. Adjustment of A/C head height and azimuth.

- a) Connect an oscilloscope to the audio output terminal.
- b) Use the alignment tape and play back its audio 6 kHz signal (monoscope pattern for video signal). Adjust the azimuth adjusting screw to obtain the maximum audio output on an oscilloscope. (See Figure 1-58.)
- c) Use the alignment tape and play back its audio 1 kHz signal (colour bar for video signal) and slowly rotate the A/C head height adjusting nut with the special box driver to obtain the maximum audio output.
- d) Perform the adjustment in b) again.
- e) After this adjustment, apply glyptal to the screws and nuts to fix them.

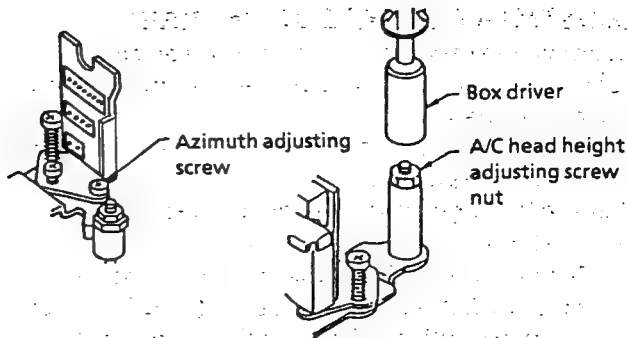


Figure 1-58.

Figure 1-59.

# 7. Adjustment of tape drive train and X-Position.

- a) Connect the oscilloscope to the test points (TP2201) for PB CHROMA envelope output. Set the synchronism of the oscilloscope to EXT. The PB CHROMA signal is to be triggered by the head switching pulse (TP2202).
- b) Play back the tape drive train alignment tape.
- c) Push the (+) or (-) button to change the envelope waveform from MAX to MIN, and MIN to MAX. Adjust the guide roller's height on the supply and take-up sides with an adjusting screw driver, to obtain an envelop waveform that is as flat as possible.
- d) If the tape is above or below the helical lead, the PB CHROMA waveform will take the shape shown in Figure 1-60.
- e) Adjust for maximum flatness of the envelope as the step 5, e) in page 25.

	When the tape is above the helical lead.		When the tape is below the helical lead.	
	Supply side	Take-up side	Supply side	Take-up side
Adjustment	Supply side guide roller rotated in clockwise direction (lowers guide roller) to flatten envelope.	Take-up side guide roller rotated in clockwise direction (lowers guide roller) to flatten envelope.	Supply side guide roller rotated in counterclockwise direction (raises guide roller) to make the tape float above the helical lead. The supply side guide roller is then rotated in the clockwise direction to flatten the envelope.	Take-up side guide roller rotated in counterclockwise direction (raises guide roller) to make the tape float above the helical lead. The take-up side guide roller is then rotated in the clockwise direction to flatten the envelope.

Figure 1-60.

- f) Push the (+) or (-) tracking button to check that a flat response is obtained on the envelope waveform.
  - g) Secure the guide roller by tightening the guide roller setscrew in the unloading mode.
  - h) Play back the tape drive train alignment tape to check that the envelope waveform does not change.
8. Adjustment of A/C head X-position.
- a) Push the (+) and (-) tracking buttons at the same time to the preset mode.
  - b) Rotate the X-position adjusting nut with an adjusting box driver, and adjust the A/C head position for maximum head switching pulse low side envelope.
  - c) Adjust the playback switching point.
  - d) Check the flatness of the envelope waveform and sound by playing back a recorded tape.

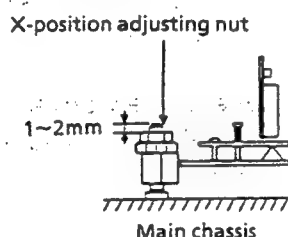


Figure 1-61.

## REPLACEMENT OF THE CAPSTAN D.D. (DIRECT DRIVE) MOTOR

- Remove the cassette housing control assembly.
- Removal (Follow the order of indicated numbers.)

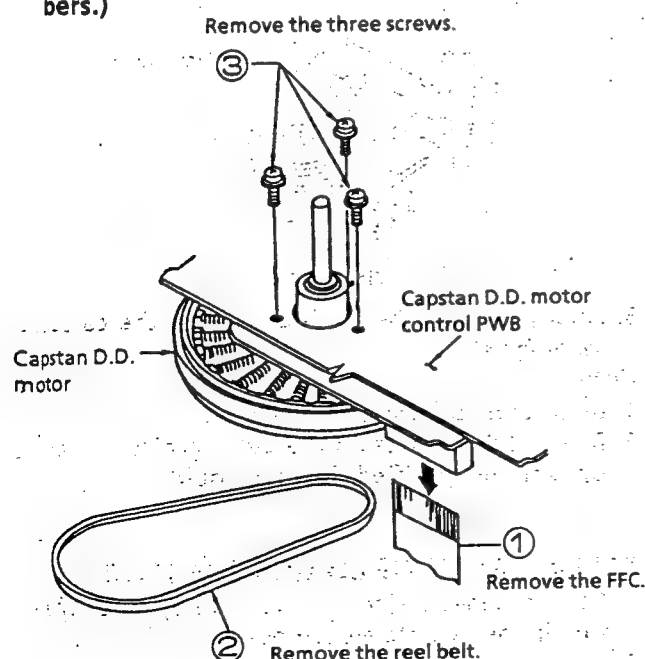


Figure 1-62.

## Reassembly

1. Mount the capstan motor on the mechanism chassis making sure not to allow the capstan shaft to hit the mechanism chassis, and attach it with the three screws.
2. Insert the FFC into the capstan D.D. motor control PWB.
3. Attach the reel belt.

## Notes:

1. After installing the capstan D.D. motor, be sure to rotate the capstan D.D. motor and check the movement.
2. Check and adjust the servo circuit.

## REMOVAL AND REASSEMBLY OF THE LOADING GEAR BLOCK

1. Remove the cassette housing control assembly.
2. Remove the reel belt.
3. Remove the reel block.

## Removal

## Notes:

1. Use care not to deform the parts hooked to the take-up loading gear and supply loading gear as shown in Figure 1-63.



Figure 1-63.

2. In removing the loading gear, secure the guide roller with a rubber band or the like beforehand for easier reassembly.

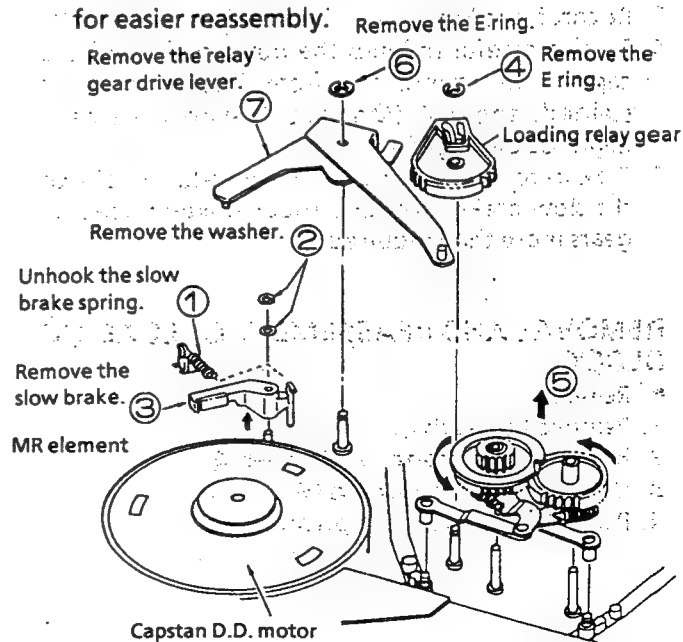


Figure 1-64.

1. Remove the slow brake spring ①.
2. Remove the washers ②.
3. Remove the slow brake lever ③.
4. Remove the E ring ④.
5. Rotate the take-up loading gear, take-up loading arm assembly, supply loading gear and supply loading arm assembly slightly in the loading direction, and take them ⑤ all out.
6. Remove the E ring ⑥.
7. Remove the relay gear drive lever ⑦.

● **Reassembly**

Reverse the procedure. Be sure to match the tally marks on the gears.

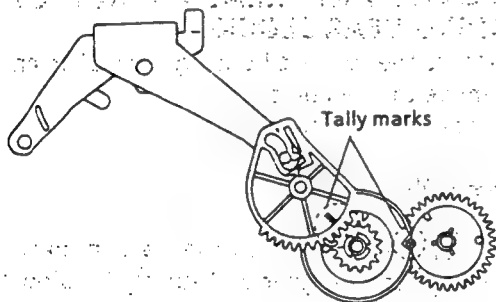


Figure 1-65.

**Notes:**

1. When reassembling, apply specified grease to the following points; all the gear teeth, all the gear shafts and the cam groove of loading relay gear.
2. Be careful not to deform the supply/take-up loading arms.
3. Be careful to keep clean the slow brake lever felt.
4. Be also careful to keep the outer surface of the capstan D.D. motor free from dust and dirt. (If stained, the MR (Magnet Resistor) element might be damaged.)
5. Take care not to deform the anti-fall hooks of the slow brake lever and supply/take-up loading gears more than required.

**REMOVAL AND REASSEMBLY OF LOADING BLOCK**

● **Removal**

1. Remove the leads ①.
2. Remove the cassette loading belt ②.
3. Unscrew the three screws ③.
4. Pull the loading block upward.

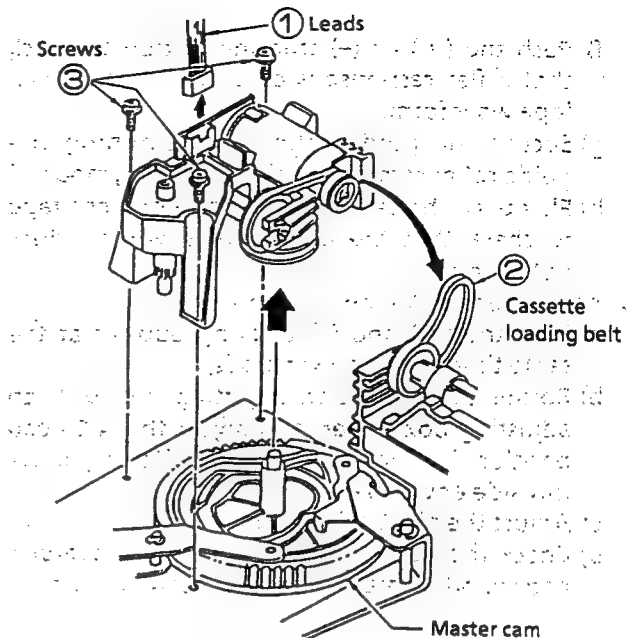


Figure 1-66.

**Note:**

When using a magnetic screw driver in removal of three screws, do not allow the magnetic driver to hit the A/C head or drums.

● **Reassembly**

1. Turn the master cam all the way counter-clockwise.
2. Match the tally mark on the cam switch with the mating mark. Fit the loading block and the master cam with each other. Tighten up the three screws.

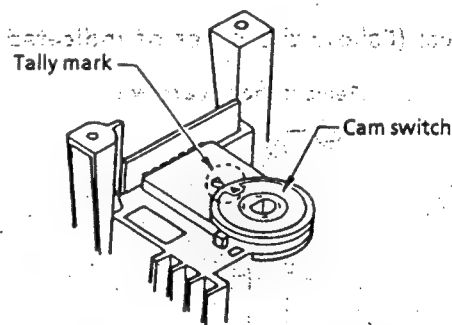


Figure 1-67.

3. Finally connect the leads and apply the cassette loading belt.

**Notes:**

1. Be careful not to scratch the gear.
2. Be careful not to stain the belt. If dirty, clean it up with the specified cleaning liquid.

**REPLACEMENT OF LOADING MOTOR**

1. Set the cassette ejected condition by placing the unit in the cassette eject mode.
2. Unplug the power cord.
3. Remove the loading block in accordance with the statements and drawings above.



## ● Removal

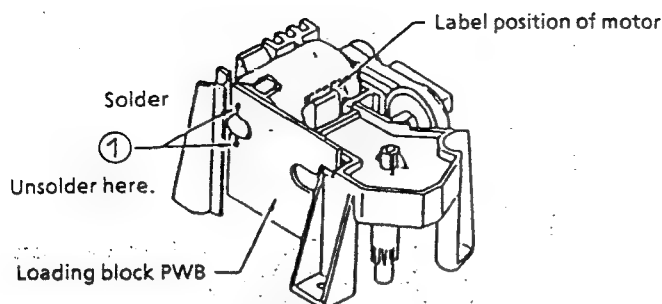


Figure 1-68.

1. Unsolder the leads ① from the loading motor.
2. Unlock the left and right catches ② of the cam switch off the loading block. Take out the cam switch and loading block PWB (See Figure 1-69).

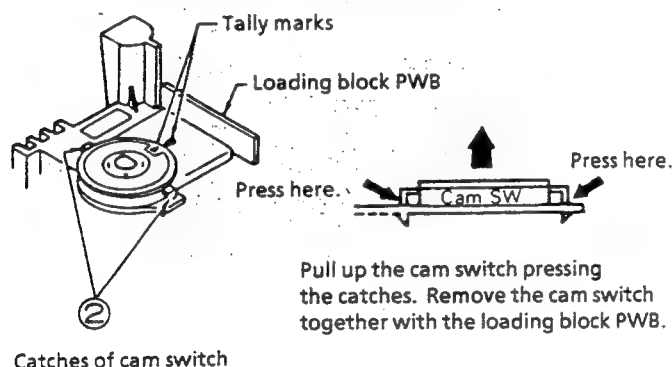


Figure 1-69.

3. Take out the loading belt ③.
4. Pry up the back end of the loading motor with a screwdriver or the like as in Figure 1-70 and take out the motor.

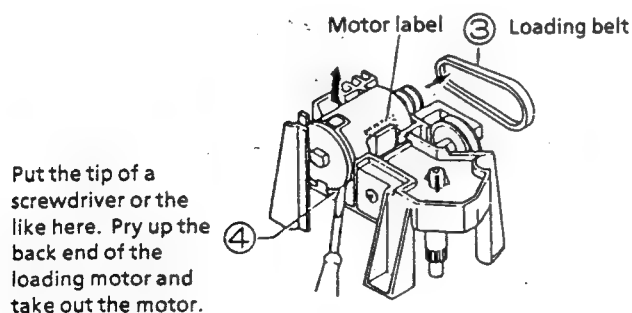


Figure 1-70.

## ● Reassembly

1. Remove the loading motor, and mount a new loading motor as in Figure 1-71.
2. Place the loading motor so that its label is visible as shown in Figure 1-71. Make sure that the screw hole at the motor shaft, protuberance on the loading block, and the motor's back end marked with the arrow are mated with each other.

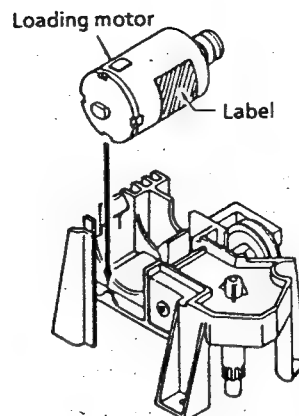


Figure 1-71.

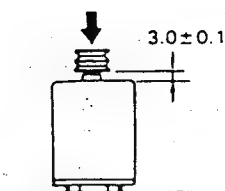


Figure 1-72.

**Note:**  
When press-fitting the loading motor pulley, keep the pressure less than 5 kg, and the gap between the motor and pulley should be  $3.0 \pm 0.1$  mm.

3. Set the loading block PWB and the cam switch in position.
4. Resolder the leads to the loading motor.
5. Finally place the loading block (See page 28).
6. Attach the loading belt.

## REPLACEMENT OF MASTER CAM

### ● Removal

1. Remove the E ring ①.
2. Remove the half-loading drive lever ②.
3. Remove the E ring ③.
4. Remove the pinch roller lever ④.
5. Pull out the master cam ⑤ upward.

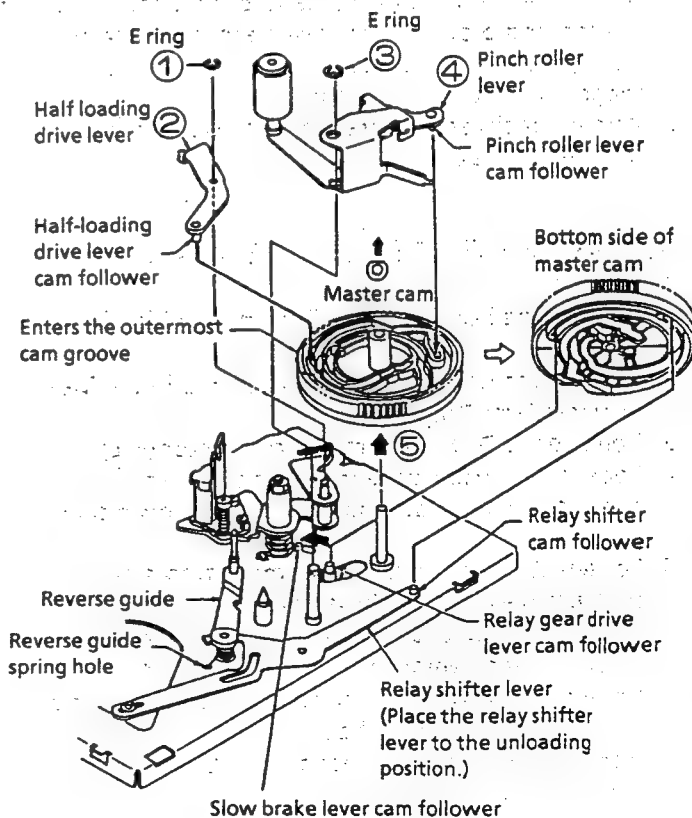


Figure 1-73.

● Reassembly

1. Place the relay gear drive lever in the unloading state.
2. Place the relay shifter so that it is in contact with the reverse guide spring hole in the mechanism chassis. Release the slow brake lever with a finger to bring it away from the capstan (in the direction of arrow). Then place the master cam so that the D cut-off part of the master cam faces the direction of arrow.
3. Place the half-loading reciprocating lever's cam follower so that it fits in the master cam's circumferential cam groove (marked with arrow), attach the E ring, then mount the half-loading reciprocating lever.
4. Turn the master cam somewhat clockwise until the pinch roller lever's cam follower goes into the master cam's groove (marked with arrow). Mount the pinch roller lever and then attach the E ring.
5. Rotate the master cam by hand to make sure all the four levers (relay gear drive lever, half-loading reciprocating lever, pinch roller lever, and relay shifter lever) are in the cam grooves in place.
6. Mount the loading block. (See page 28.)

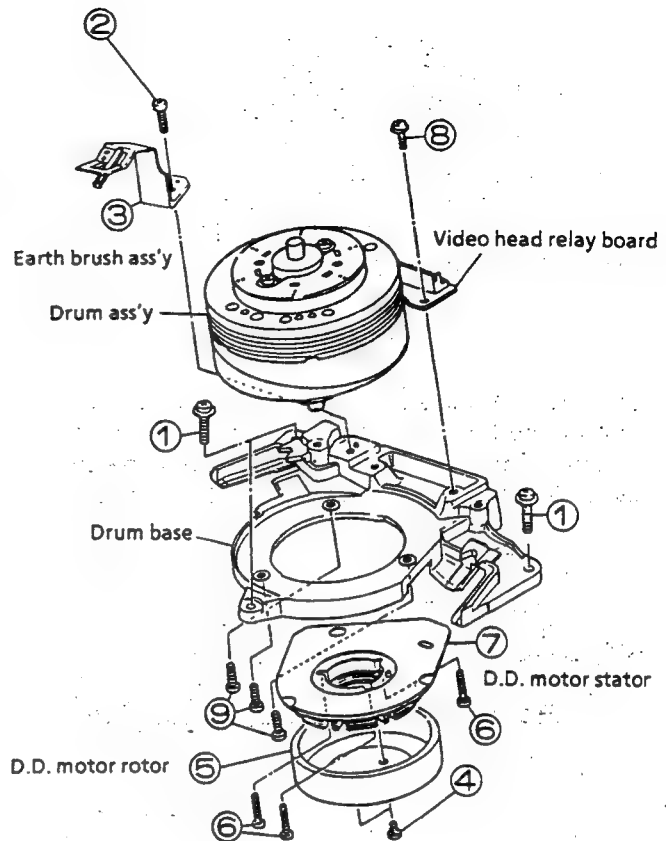
Notes:

1. Be careful not to scratch the teeth and grooves of the master cam.
2. After installation of the master cam, be sure to rotate the master cam by hand before installing the loading block. If the levers are in wrong position, the master cam and the levers may get damaged when the motor starts.
3. Apply specified grease to the master cam's grooves and teeth.

## REPLACEMENT OF DRUM ASSEMBLY

● Removal

1. Remove the head amp. PWB from the video head relay board.
2. Remove the bottom plate (Ref. No 603 in the Mechanical Parts Diagram).
3. Remove the D.D. drum motor connector (ME).
4. Loosen the drum base mounting screws ① and remove the drum ass'y from the mechanism chassis.
5. Loosen the earth brush ass'y mounting screw ② and remove the earth brush ass'y ③.
6. Loosen the two D.D. motor rotor mounting screws ④ and remove the D.D. motor rotor ⑤.
7. Loosen the three D.D. motor stator mounting screws ⑥ and remove the stator ⑦.
8. Remove the two video head relay board mounting screws ⑧.
9. Loosen the three drum ass'y mounting screws ⑨ and remove the drum ass'y from the drum base.



Note:

Secure the D.D. rotor assembly so that the installation positioning holes in the D.D. rotor assembly and lower drum match.

Figure 1-74.

# ● Reassembly

## Notes:

1. Before setting the drum, check that there are no scratches or dust on the edge of the surface and circumference of the disk.
2. Before setting the drum, check that there are no scratches or dust on the internal surface and edge of the surface of the upper drum.
3. On assembling these parts, insert the upper drum onto the disk with care, so that the upper drum is not tilted.
4. When assembling these parts, do not allow dust or dirt come between the disk and the upper drum.
5. Do not use excessive force when driving in the screws.

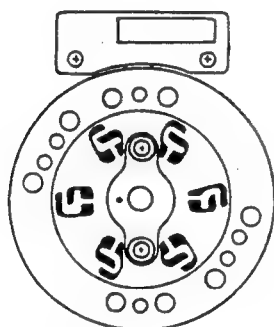


Figure 1-75.

1. Set the new drum.
2. Place the relay PWB as shown in Figure 1-75 and solder it securely.

## Note:

Soldering should be performed quickly and carefully without touching adjacent patterns.

3. After replacement, be sure to check the tape drive train adjustment (see page 25.) and the following electric adjustments.
  - 1) Adjustment of the playback switching point.
  - 2) Checking and adjustment of the X-position.
  - 3) Adjustment of SP and LP slow tracking preset.

# REPLACEMENT OF D.D. MOTOR

1. Put the unit in the cassette eject position.
2. Unplug the power cord.

## ● Removal (Reverse the order in reassembly.)

1. Remove the FFC ①.
2. Remove the two D.D. rotor assembly setscrews ②.
3. Pull out the D.D. rotor ass'y ③.
4. Remove the three D.D. stator setscrews ④.
5. Remove the D.D. stator assembly ⑤.

## Notes:

1. When removing the D.D. rotor assembly or D.D. stator assembly, use care not to hit the loading relay gear.
2. Secure the D.D. rotor assembly so that the installation positioning holes in the D.D. rotor assembly and lower drum assembly match.
3. Be careful not to damage the upper drum or the video head.
4. Be sure that the hall device and the D.D. stator assembly are not damaged by the D.D. rotor assembly or other parts.
5. After installation, adjust the playback switching point.

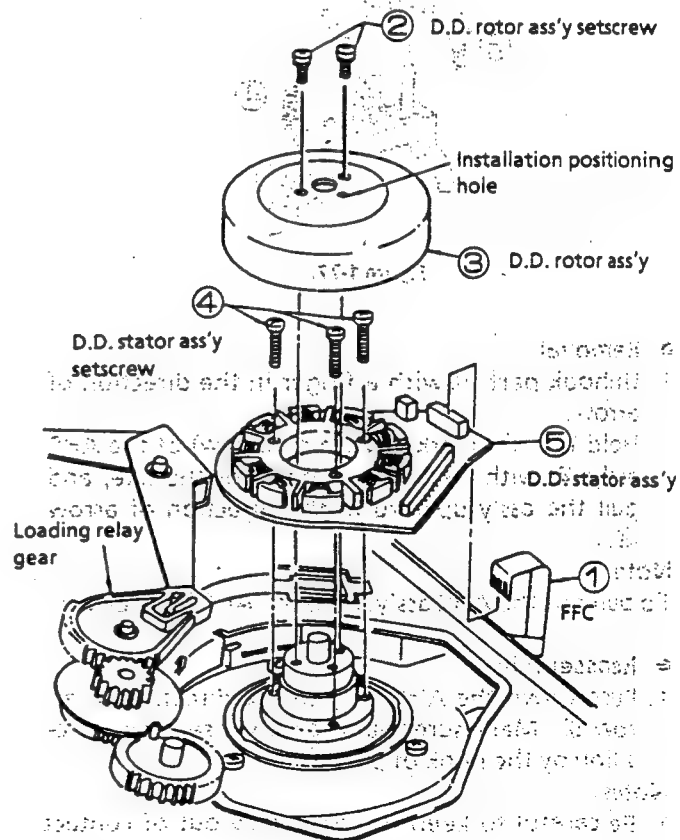


Figure 1-76.

## REPLACING THE AHC (AUTOMATIC HEAD CLEANER)

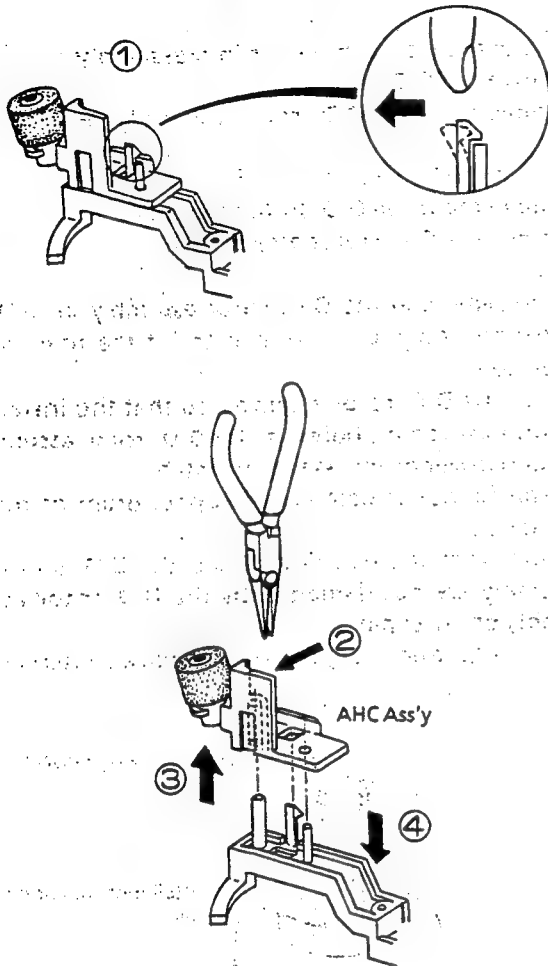


Figure 1-77.

### ● Removal

1. Unhook part ① with a finger in the direction of arrow.

Hold the rib (marked with an arrow) of the AHC ass'y ② with electrician's pliers or the like, and pull the ass'y upward in the direction of arrow ③.

### Note:

To pull out the AHC ass'y, hold the AHC lever down.

### ● Reassembly

1. Push down the AHC ass'y in the direction of arrow ④. Make sure that the ass'y is secured in position by the hook of part ①.

### Notes:

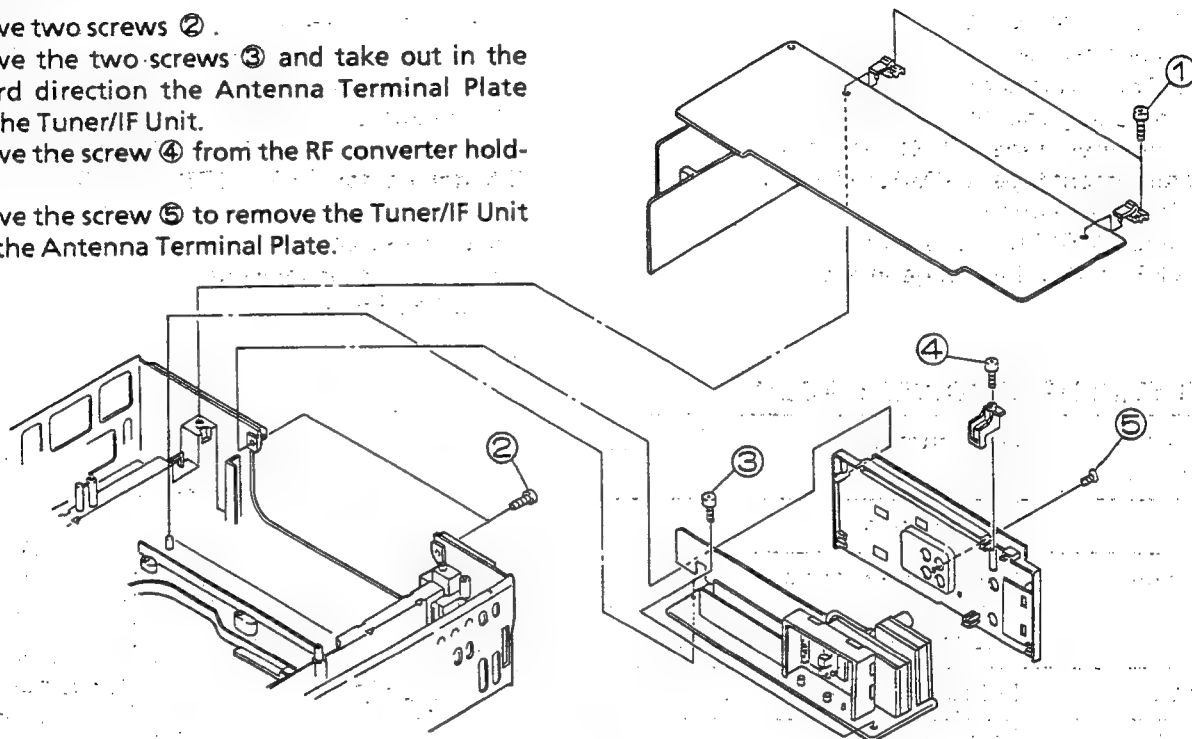
1. Be careful to keep the AHC ass'y out of contact with the drum.
2. Be careful to keep the cleaner section of the ass'y free of grease or contaminants.

## ADJUSTMENT OF THE ELECTRICAL CIRCUITRY

### ■ DISASSEMBLY OF TUNER/IF UNIT AND POWER UNITS

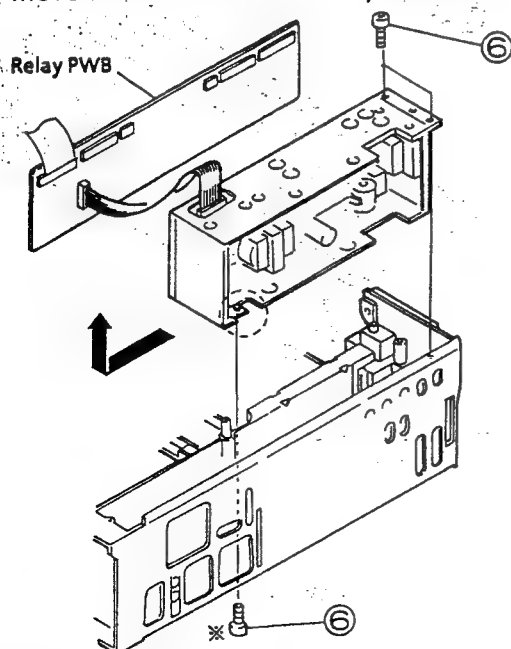
#### ● Tuner/IF Unit

1. Remove two screws ① which fasten the Main PWB.
2. Remove two screws ②.
3. Remove the two screws ③ and take out in the upward direction the Antenna Terminal Plate with the Tuner/IF Unit.
4. Remove the screw ④ from the RF converter holder.
5. Remove the screw ⑤ to remove the Tuner/IF Unit from the Antenna Terminal Plate.



#### ● Power Unit

1. Remove three screws ⑥ which fasten the Power Unit.
2. Lift up the Relay PWB.
3. Slide the Power Unit in the direction of the arrow to uncouple it from the main frame, and remove the Power Unit in the upward direction.



#### Note:

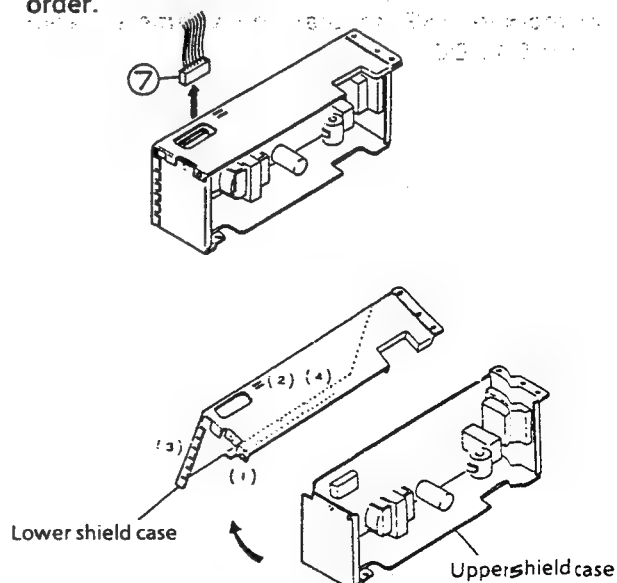
The screw marked (※) is used to tighten up the bottom plate.

#### ● Power Unit Shield Case

1. Remove the wire lead with Connector PA ⑦.
2. Hold the Upper Shield Case down and remove the Lower one by turning it in the direction of the arrow.

#### Note:

For easier coupling, fit at locations (1) to (4) in this order.



# Notes:

- Before the adjustment:  
Electrical adjustments discussed here are often required after replacement of electronic components and mechanical parts such as video heads.  
Check that the mechanism and all electric components are in good working condition prior to the adjustment, otherwise adjustments can not be completed.
- Instruments required:
  - ⊙ Colour monitor TV
  - ⊙ Dual-trace oscilloscope
  - ⊙ AC milli-voltmeter
  - ⊙ Frequency counter
  - ⊙ Alignment tape (VROCPSV) (PAL)
  - ⊙ Alignment tape (VROATSV) (NTSC)
  - ⊙ Extension connector (QCNW-6443GEZZ : 2 pin)
  - ⊙ VHF band AM signal generator
  - ⊙ Colour bar generator
  - ⊙ DC regulated power supply
  - ⊙ Audio signal generator
  - ⊙ DC voltmeter
  - ⊙ Hi-Fi alignment tape (VROCBFFS) (PAL)
  - ⊙ Alignment tape (VRONBZZS) (NTSC)
  - ⊙ Alignment tape (VR9EBZCS) (NTSC)
  - ⊙ Blank video cassette tape
  - ⊙ Screwdriver for adjustment
  - ⊙ Field strength meter

## ADJUSTMENT OF POWER CIRCUIT

Measuring instrument	DC voltmeter
Mode	Recording mode
Test point	Pin ④ of AP connector and ground (Located on the main module)
Control	R916 adjustment control
Specification	$6.6 \pm 0.1V$ DC

1. Put the unit in recording mode and connect a DC voltmeter to pin 4 (+) of AP connector and ground (-).  
(AP connector is located on the main module.)
2. Supply the unit with the rated AC power.
3. Insert a screw driver thru a right side hole on the frame and adjust R916 located on the power module PWB so that the voltmeter reads  $6.6 \pm 0.1V$  DC.

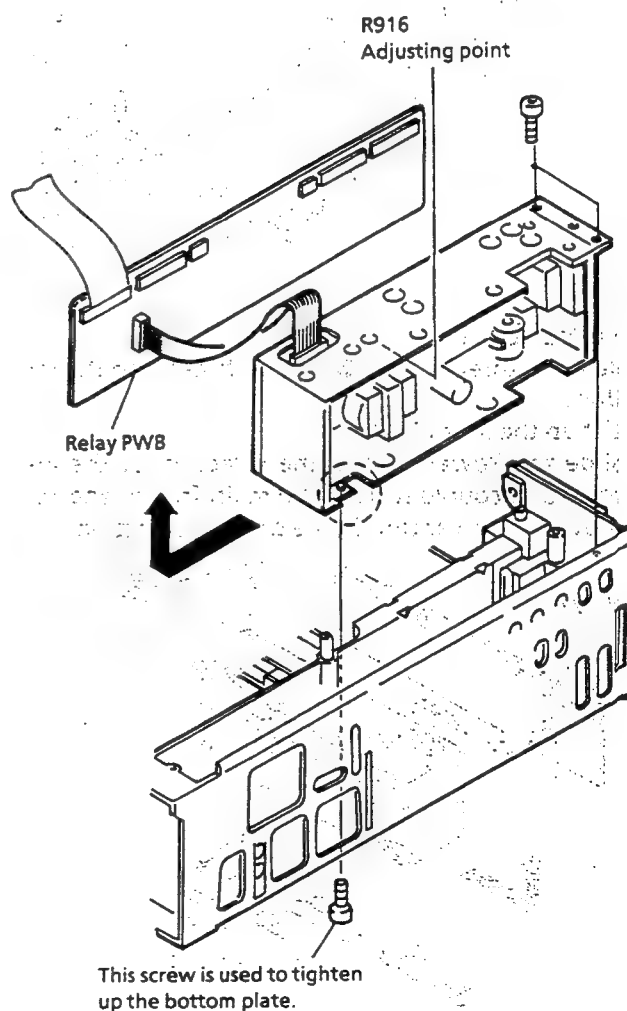


Figure 2-1.

## SERVO CIRCUIT ADJUSTMENT

## ADJUSTMENT OF PAL SYSTEM PLAYBACK SWITCHING POINT

Measuring instrument	Dual-trace oscilloscope
Mode	Playback (Tracking at center)
Cassette	Alignment tape (VROCPSV)
Test point	CH-1: TP2202 CH-2: Video output terminal (CH-1 trigger slope switch at (+), Internal trigger at CH-1 side)
Control	R701 PAL phase generator M.M. adjustment control
Specification	$6.5 \pm 0.5H$

1. Remove the front panel.
2. Play the PAL system alignment tape (VROCPSV) and put the unit in the playback mode.
3. Place the unit to tracking in the center mode. (See Note below.)
4. Connect a dual-trace oscilloscope to the video output terminal and TP2202. (CH-1 trigger slope switch at (+), Internal trigger at CH-1 side)
5. Adjust R701 so that the leading edge of the head switching pulse is  $6.5H$  (lines) ahead of the vertical sync as shown in Figure 2-2.

## Notes:

How to tracking in the center mode. (In the playback mode only.)

- ① Remove the cassette housing control ass'y.
- ② Make a short-circuit between jumper pin at TEST26 and TEST27 (Located on the timer module) using a lead wire.

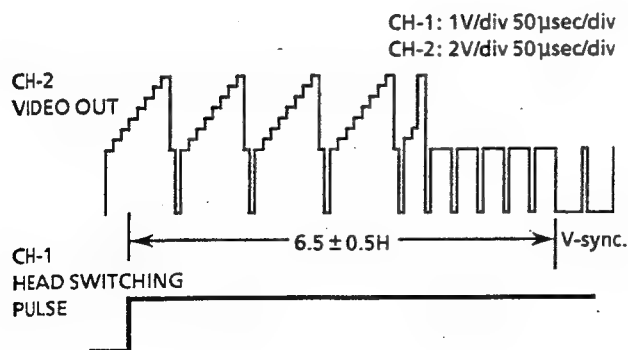


Figure 2-2.

## ADJUSTMENT OF PAL SYSTEM SLOW TRACKING PRESET

Measuring instrument	Monitor TV
Mode	Recording and playback on self-recording tape (See Note ① below.)
Input signal	Commercial broadcast or video signal (External input selector switch)
Test point	Monitor screen
Control	Tracking control button (+) or (-)
Specification	Minimized noise bar on monitor screen

1. Have the unit to receive a Commercial broadcast signal or feed the video signal to the external video input terminal.
2. Play back the self-recording tape PAL system SP mode.
3. Make a short-circuit between jumper pin at TEST26 and TEST27 using a lead wire so that the test mode. (See Note ② below.)
4. Be sure that all the fluorescent display-tube light up and then remove the lead wire.
5. Press the SLOW button on the remote controller, and playback the recorded portion on the slow mode.
6. Look at the monitor screen and adjust the tracking control using the tracking button (+) or (-) on the main unit or the remote controller so that the noise disappears from the screen.
7. Press the STOP button in the slow tracking preset data are memorized.
8. Press the all clear button in the return to normal mode.

## Notes:

- ① Self-recorded tape means a cassette whose program was recorded by the unit being adjusted.
- ② Jumper pin TEST26 and TEST27 are located on the up side of TA connector in the timer module.

## ADJUSTMENT OF PAL SYSTEM LP SLOW TRACKING PRESET

Measuring instrument	Monitor TV
Mode	Recording and playback on self-recording tape (See Note ① below.)
Input signal	Commercial broadcast or video signal (External input selector switch)
Test point	Monitor screen
Control	Tracking control button (+) or (-)
Specification	Minimized noise bar on monitor screen

1. Have the unit to receive a Commercial broadcast signal or feed the video signal to the external video input terminal.
2. Play back the self-recording tape PAL system LP mode.
3. Make a short-circuit between jumper pin at TEST26 and TEST27 using a lead wire so that the test mode. (See Note ② below.)
4. Be sure that all the fluorescent display tube light up and then remove the lead wire.
5. Press the SLOW button on the remote controller, and playback the recorded portion on the slow mode.
6. Look at the monitor screen, and adjust the tracking control using the tracking button (+) or (-) on the main unit or the remote controller so that the noise disappears from the screen.
7. Press the STOP button in the slow tracking preset data are memorized.
8. Press the all clear button in the return to normal mode.

### Notes:

- ① Self-recorded tape means a cassette whose program was recorded by the unit being adjusted.
- ② Jumper pin TEST26 and TEST27 are located on the up side of TA connector in the timer module.

## ADJUSTMENT OF PAL SYSTEM PAUSE/STILL PICTURE VERTICAL SYNC

Measuring instrument	Monitor TV
Mode	Still picture Playback on self-recording tape (See Note below.)
Input signal	Commercial broadcast or video signal (External input selector switch)
Test point	Monitor screen
Control	Tracking control button (+) or (-)
Specification	No vertical jitter of picture

1. Have the unit receive a Commercial broadcast signal or feed the video signal to the external video input terminal.
2. Play back the self-recording tape PAL system SP mode.
3. Press the PAUSE/STILL button on the main unit or the remote controller, and playback the recorded portion in the SP mode.
4. Look at the monitor screen, and adjust the tracking control using the tracking button (+) or (-) on the main unit or the remote controller, make adjustment so that jitter becomes minimum.
5. Press the STOP button in the PAUSE/STILL preset data are memorized.

### Notes:

Self-recorded tape means a cassette whose program was recorded by the unit being adjusted.



**ADJUSTMENT OF NTSC SYSTEM PLAYBACK SWITCHING POINT**

Measuring instrument	Dual-trace oscilloscope
Mode	Playback (Tracking at center)
Cassette	Alignment tape (VROATSV)
Test point	CH-1: TP2202 CH-2: Video output terminal (CH-1 trigger slope switch at (+), Internal trigger at CH-1 side)
Control	R704 NTSC phase generator M.M. adjustment control
Specification	$6.5 \pm 0.5H$

1. Remove the front panel.
2. Play the NTSC system alignment tape (VROATSV) and put the unit in the playback mode.
3. Place the unit to tracking in the center mode. (See Note below.)
4. Connect a dual-trace oscilloscope to the video output terminal and TP2202. (CH-1 trigger slope switch at (+), Internal trigger at CH-1 side)
5. Adjust R704 so that the leading edge of the head switching pulse is  $6.5H$  (lines) ahead of the vertical sync. as shown in Figure 2-3.

**Notes:**

How to tracking in the center mode. (In the playback mode only.)

- ① Removed the cassette housing control ass'y.
- ② Make a short-circuit between jumper pin at TEST26 and TEST27 (Located on the timer module) using a lead wire.

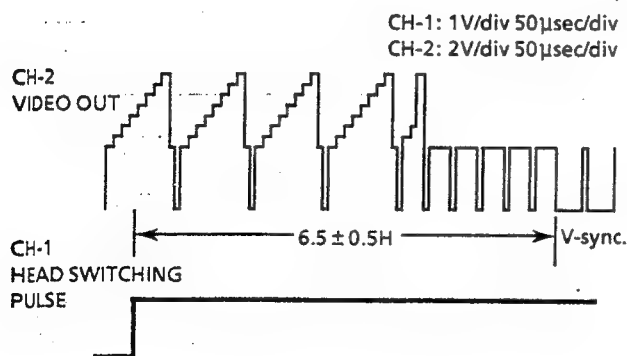


Figure 2-3.

**ADJUSTMENT OF NTSC SYSTEM SP SLOW TRACKING PRESET**

Measuring instrument	Monitor TV
Mode	Playback (SP mode playback)
Cassette	Alignment tape (VRONBZZS)
Test point	Monitor screen
Control	Tracking control button (+) or (-)
Specification	Minimized noise bar on monitor screen

1. Play back the NTSC system alignment tape (VRONBZZS) and put the unit in the SP portion playback mode.
2. Make a short-circuit between jumper pin at TEST26 and TEST27 using a lead wire so that the test mode. (See Note below.)
3. Be sure that all the fluorescent display tube light up and then remove the lead wire.
4. Press the SLOW button on the remote controller, and playback the recorded portion on the slow mode.
5. Look at the monitor screen, and adjust the tracking control using the tracking button (+) or (-) on the main unit or the remote controller so that the noise disappears from the screen.
6. Press the STOP button in the slow tracking preset data are memorized.
7. Press the all clear button in the return to normal mode.

**Note:**

Jumper pin TEST26 and TEST27 are located on the up side of TA connector in the timer module.

**ADJUSTMENT OF NTSC SYSTEM EP SLOW TRACKING PRESET**

Measuring instrument	Monitor TV
Mode	Playback (EP mode playback)
Cassette	Alignment tape (VR9EBZCS)
Test point	Monitor screen
Control	Tracking control button (+) or (-)
Specification	Minimized noise bar on monitor screen

1. Play back the NTSC system alignment tape (VR9EBZCS) and put the unit in the EP portion playback mode.
2. Make a short-circuit between jumper pin at TEST26 and TEST27 using a lead wire so that the test mode. (See Note below.)
3. Be sure that all the fluorescent display tube light up and then remove the lead wire.
4. Press the SLOW button on the remote controller, and playback the recorded portion on the slow mode.
5. Look at the monitor screen, and adjust the tracking control using the tracking button (+) or (-) on the main unit or the remote controller so that the noise disappears from the screen.
6. Press the STOP button in the slow tracking pre-set data are memorized.
7. Press the all clear button in the return to normal mode.

**Note:**

Jumper pin TEST26 and TEST27 are located on the up side of TA connector in the timer module.

**ADJUSTMENT OF NTSC SYSTEM PAUSE/STILL PICTURE VERTICAL SYNC.**

Measuring instrument	Monitor TV
Mode	Still picture playback
Cassette	Alignment tape (VRONBZZS)
Test point	Monitor screen
Control	Tracking control button (+) or (-)
Specification	No vertical jitter of picture

1. Play back the NTSC system alignment tape (VRONBZZS) and put the unit in the SP portion playback mode.
2. Press the PAUSE/STILL button on the main unit or the remote controller, and playback the recorded portion in the SP mode.
3. Look at the monitor screen, and adjust the tracking control using the tracking button (+) or (-) on the main unit or the remote controller, make adjustment so that jitter becomes minimum.
4. Press the STOP button in the PAUSE/STILL pre-set data are memorized.

**Note:**

Jumper pin TEST26 and TEST27 are located on the up side of TA connector in the timer module.

**• Location of controls and test points of main module**

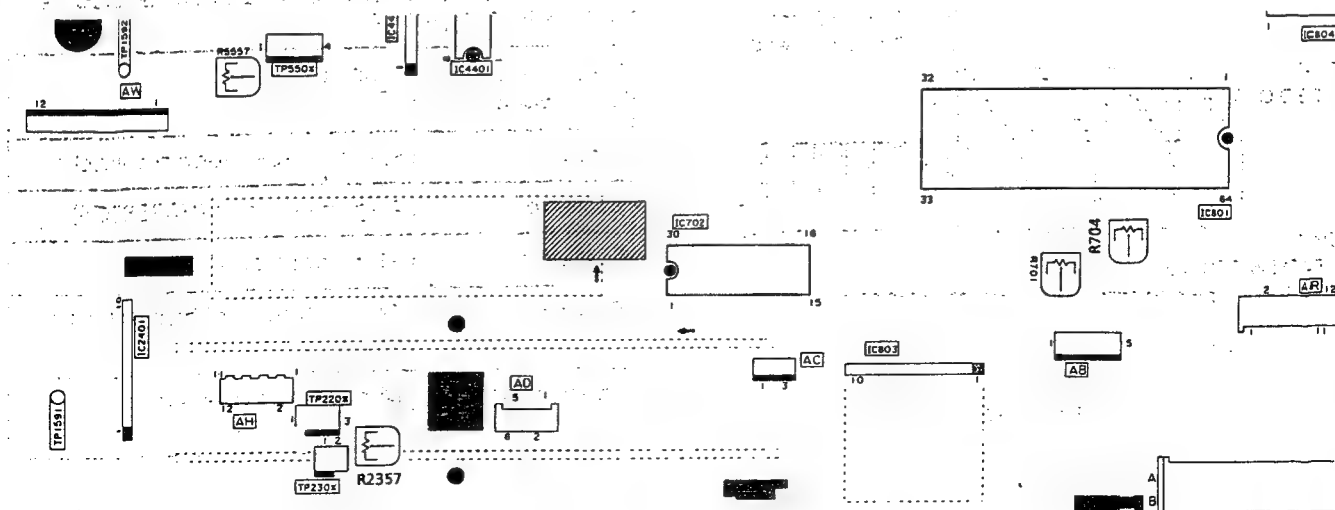


Figure 2-4.

## Y/C CIRCUIT ADJUSTMENT

### ADJUSTMENT OF VIDEO E-E GAIN

Measuring instrument	Oscilloscope
Mode	Stop or Record (Colour system: PAL)
Input signal	EBU standard colour bar (1.0Vp-p)
Test point	VIDEO OUT jack
Control	R203 E-E level control
Specification	1.0V $\pm$ 0.04 Vp-p

1. Connect a 75 ohm terminating resistor to the VIDEO OUT jack and connect an oscilloscope across this terminating resistor.  
(See Note ① below.)
2. Feed a colour bar signal to the VIDEO IN jack and put the unit in A/V mode by selecting channel AV.
3. Adjust R203 so that the signal amplitude is 1.0Vp-p as shown in Figure 2-5.

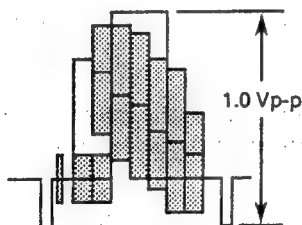


Figure 2-5.

#### Notes:

- ① If the 75 ohm terminating resistor is missing, the signal amplitude will be doubled.
- ② After this adjustment, check the deviation of FM luminance signal.  
(R204 Frequency and Deviation adjustment.)

### ADJUSTMENT OF PLAYBACK Y-GAIN

Measuring instrument	Oscilloscope
Mode	Playback
Cassette	Alignment tape (VROCP5V)
Test point	VIDEO OUT jack
Control	R201 Playback Y-level control
Specification	1.0 $\pm$ 0.04Vp-p

1. Connect a 75 ohm terminating resistor to the VIDEO OUT jack and connect an oscilloscope across this terminating resistor.  
(See Note below.)

2. Play the colour bar portion of the alignment tape and adjust R201 so that the signal amplitude is 1.0Vp-p as shown in Figure 2-6.

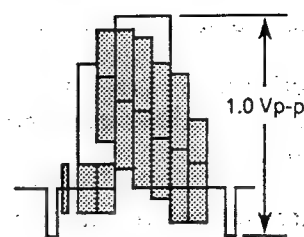


Figure 2-6.

#### Note:

If the 75 ohm terminating resistor is missing, the signal amplitude will be doubled.

### ADJUSTMENT OF FM CARRIER FREQUENCY AND DEVIATION

Measuring instrument	Frequency counter oscilloscope
Mode	Record/Playback (Colour system: PAL)
Input signal	EBU standard colour bar (1.0Vp-p)
Test point	TP203 (pin ④ of IC201) VIDEO OUT jack
Controls	R205 FM carrier control R204 Deviation control
Specifications	3.8 $\pm$ 0.05 MHz 1.0 $\pm$ 0.04 Vp-p

1. Be sure that R203 (E-E level) has been correctly adjusted.
2. Connect a 75 ohm terminating resistor to the VIDEO OUT jack and connect an oscilloscope across this terminating resistor.  
(See Note next page.)
3. Connect a frequency counter to test point TP203 ~ ground.
4. Put the unit in A/V input mode by selecting channel AV.  
Do not feed any signal to the VIDEO IN jack.  
(Disconnect any cable from video input terminal.)
5. Under this condition, adjust R205 so that the frequency counter reads 3.8MHz.
6. Feed the colour bar signal to the VIDEO IN jack and adjust R204 so that the frequency counter reads 4.3MHz.
7. Under this condition, record the EBU colour bar signal on tape, rewind and play it.



## SECAM CHROMA CIRCUIT ADJUSTMENT

### ADJUSTMENT OF BELL FILTER (VC-H91/H91ETS ONLY)

Measuring instrument	Oscilloscope
Mode	Record (SP mode)
Input signal	EBU standard SECAM colour bar (1.0Vp-p)
Test point	TP5302 (Sig.) ~ TP5301 (GND)
Control	FL5304 (4.3MHz bell filter)
Specification	_____

1. Feed the SECAM colour bar signal to the VIDEO IN jack and put the unit in A/V mode by selecting channel A/V.
2. Connect an oscilloscope to test points TP5302 (Sig.) ~ TP5301 (GND). (Triggered on TP5303.)
3. Put the unit in record mode with the tape speed in SP mode. (Not in LP mode.)
4. Adjust FL5304 (4.3MHz bell filter) so that the match with the flat portion of the red and blue as shown in Figure 2-12.

Note:

TP5302 (Sig.) ~ TP5301 (GND) and FL5304 (4.3MHz bell filter) located on the SECAM chroma module.

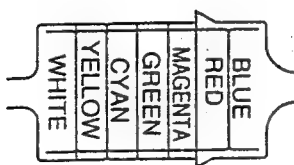


Figure 2-12.

### ADJUSTMENT OF RECORD EQUALIZER (VC-H91/H91ETS ONLY)

Measuring instrument	Oscilloscope
Mode	Record (SP mode)
Input signal	EBU standard SECAM colour bar (1.0Vp-p)
Test point	TP5305 (Sig.) ~ TP5301 (GND)
Control	FL5306 (1.1MHz bell filter)
Specification	_____

1. Feed the SECAM colour bar signal to the VIDEO IN jack and put the unit in A/V mode by selecting channel A/V.
2. Connect an oscilloscope to test points TP5305 (Sig.) ~ TP5301 (GND). (Triggered on TP5303.)
3. Put the unit in record mode with the tape speed in SP mode. (Not in LP mode.)
4. Adjust FL5306 (1.1MHz bell filter) so that the match with in doubled portion of the magenta as shown in Figure 2-13.

Note:

TP5305 (Sig.) ~ TP5301 (GND) and FL5306 (1.1MHz bell filter) located on the SECAM chroma module.

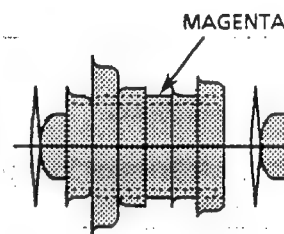


Figure 2-13.

### ADJUSTMENT OF SYNC GATE MODE (VC-H91/H91ETS ONLY)

Measuring instrument	Dual-trace oscilloscope
Mode	Record (SP mode)
Input signal	EBU standard SECAM colour bar (1.0Vp-p)
Test point	CH-1 ~ TP5304 (Chroma sig.) ~ TP5301 (GND) CH-2 ~ TP5303 (H-sync sig.) ~ TP5301 (GND)
Control	R5310 (Sync gate adj-A) R5311 (Sync gate adj-B)
Specification	Gate (A) $\approx 2.0 \pm 0.2 \mu\text{sec}$ Gate (B) $\approx 3.8 \pm 0.1 \mu\text{sec}$

1. Feed the SECAM colour bar signal to the VIDEO IN jack and put the unit in A/V mode by selecting channel A/V.
2. Connect a dual-trace oscilloscope with delayed sweep to test points CH-1 ~ TP5304 (Chroma sig.) ~ TP5301 (GND) and CH-2 ~ TP5303 (H-sync sig.) ~ TP5301 (GND) and make sure that the chroma signal out put is just as shown in Fig 2-14.
3. Put the unit in record mode with the tape speed in SP mode. (Not in LP mode.)

- Adjust R5310 (Sync gate adj-A) and R5311 (Sync gate adj-B) so that the intervals A and B in the waveform of the output at TP5304 (Chroma sig.) and those in the TP5303 (H-sync sig.) waveform should be corresponding to each other.

**Note:**

TP5304 (Chroma sig.), TP5303 (H-sync sig.) TP5301 (GND), R5310 (Sync gate adj-A) and R5311 (Sync gate adj-B) located on the SECAM chroma module.

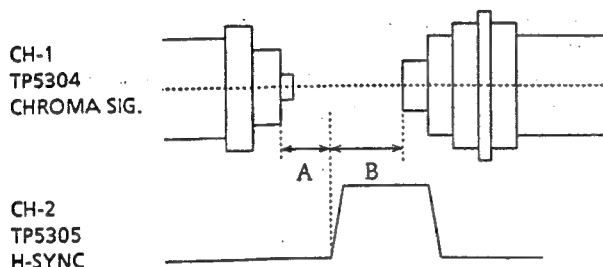


Figure 2-14.

### ADJUSTMENT OF PLAYBACK EQUALIZER (VC-H91/H91ETS ONLY)

Measuring instrument	Oscilloscope
Mode	Playback mode
Cassette	Alignment tape (VROCSSV)
Test point	TP5304 (Sig.) ~ TP5301 (GND)
Control	FL5303 (1.1MHz PB bell filter)
Specification	_____

- Connect an oscilloscope to test points TP5304 (Sig.) ~ TP5301 (GND).
- Play the SECAM colour bar portion of the alignment tape (VROCSSV).
- Adjust FL5303 (1.1MHz playback bell filter) so that the match with the flat portion of the red and blue as shown in Figure 2-15.

**Note:**

TP5304 (Sig.) ~ TP5301 (GND) and FL5303 (1.1MHz PB bell filter) located on the SECAM chroma module.

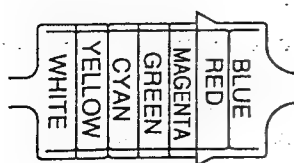


Figure 2-15.

### ADJUSTMENT OF RECORD CURRENT (SECAM) (VC-H91/H91ETS ONLY)

Measuring instrument	Oscilloscope
Mode	Record (SP or LP mode)
Input signal	EBU standard SECAM colour bar (1.0Vp-p)
Test point	TP301 (Sig.) ~ TP302 (GND)
Control	R5348 (REC-C. ADJ.)
Specification	$23 \pm 1\text{mVp-p}$ (When the LP mode)

- Feed the SECAM colour bar signal to the VIDEO IN jack and put the unit in A/V mode by selecting channel A/V.
- Connect an oscilloscope to test points TP301 (Sig.) ~ TP302 (GND). TP301 (Sig.) ~ TP302 (GND) located on the head amplifier module.
- Put the unit in record mode with the tape speed in SP or LP mode.
- Short between TP203 and ground with a  $47\mu\text{F}/16\text{V}$  electrolytic capacitor at minimize the FM luminance signal.
- Adjustment R5348 (REC-C.) so that the amplitude of the cyan portion is  $23 \pm 1\text{mVp-p}$  (When the LP mode) as shown in Figure 2-16.

**Note:**

R5348 (REC-C. ADJ.) located on the SECAM chroma module.

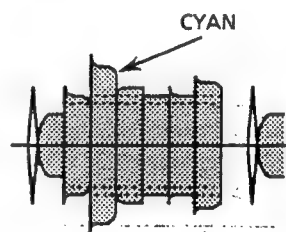


Figure 2-16.

### • Location of controls and test points of SECAM CHROMA module

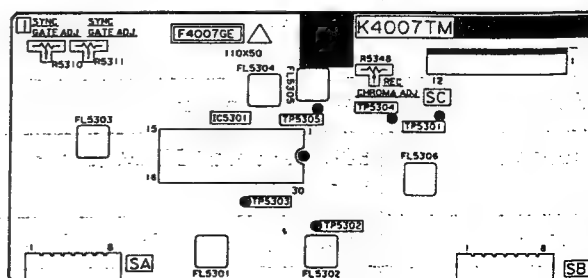


Figure 2-17.

## NTSC → PAL CONVERSION/AI/IF CIRCUIT ADJUSTMENT

### ADJUSTMENT OF NTSC → PAL CONVERSION CIRCUIT

Measuring instrument	Frequency counter
Mode	Playback
Cassette	Alignment tape (VROATSV)
Test point	TP5502 (Signal), TP5501 (GND)
Control	R5557 VCO control
Specification	15735 ± 20Hz

1. Play back the alignment tape (VROATSV). Set the colour mode switch to "AUTO" position.
2. Make a short-circuit between TP5504 (pin (15) of IC5501) and TP5503 (PC5V) using a lead with clip.
3. Connect a frequency counter to test points TP5502 (Signal), TP5501 (GND). Adjust R5557 so that the counter reads the value below.  
(Specification: 15735 ± 20Hz.)  
(A free-run state is brought in the step 2 above, however a pull-in of ± 30Hz or so still caused.)
4. Disconnect the clip-fitted lead and make sure that the image is reproduced in colours in the PAL mode. (With a PAL CTV or a multi-system CTV in the PAL mode.)

### ADJUSTMENT OF AUTO PICTURE CIRCUIT

Measuring instrument	DC voltmeter
Mode	Record and playback on selfrecording tape at SP mode (Colour system PAL)
Input signal	EBU standard colour bar signal
Test point	TP2301 (Signal), TP2302 (GND)
Control	R2357 Picture control
Specification	2.6 ± 0.1V DC

1. Be sure that the Y/C record current (R208, R504) has been correctly adjusted.
2. Set the auto picture switch to "ON" or "AUTO PICTURE" position and picture tone volume in center.
3. Connect the DC voltmeter to test points TP2301 (+) and TP2302 (-). Adjust R2357 so that the DC voltmeter reads 2.6 ± 0.1V DC.

## NTSC SKEW ADJUSTMENT

### ADJUSTMENT OF NTSC SKEW COMPENSATION

Measuring instrument	Dual-trace oscilloscope and monitor TV
Mode	Playback (SP still mode)
Cassette	Alignment tape (VROATSV)
Test point	CH-1: TP2202 (Head switching pulse) CH-2: Video output terminal
Control	R4411 (NTSC skew adj.)
Specification	No flicker on the monitor TV screen

1. Insert the alignment tape (VROATSV) and place the unit to the playback still mode.
2. Connect a dual-trace oscilloscope to test points CH-1: TP2202 (Head switching pulse.) and CH-2: Video output terminal.
3. Observe the output of TP2202 (head switching pulse) and video output terminal with an oscilloscope.
4. Adjust R4411 (NTSC skew adj.) so that there is a video level difference of ± 0.1V between CH-1 output (head switching pulse's High level) and CH-2 output (head switching pulse's Low level).
5. If the colour flicker is so noticeable on the TV monitor, finely adjust R4411 so that there is the least deviation of flicker on the screen.

Note: TP2202 (Head switching pulse) and R4411 (NTSC skew adj.) located on the main module.

#### • Location of controls and test points of main module

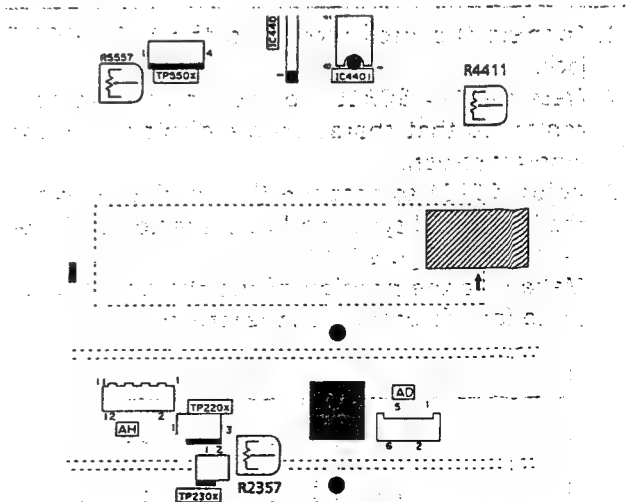


Figure 2-18.

## OSD CIRCUIT ADJUSTMENT

### ADJUSTMENT OF OSD AFC

Measuring instrument	Frequency counter
Mode	Blue background
Test point	TP5901 (signal), TP5903 (GND)
Control	R5912 AFC control
Specification	15.625 $\pm$ 0.2kHz

1. Connect the frequency counter to test points TP5901 (signal) and TP5903 (GND) located on the terminal module.
2. Press the ON SCREEN button on the remote control so that characters are displayed.
3. Apply 5V DC to TP5902 via a 1k ohm resistor. (Or have the unit receive an unoccupied TV channel.)
4. Adjust R5912 so that the frequency counter reads 15.625kHz.
5. Remove the 1k ohm resistor (or have the unit an occupied channel) and make sure that the character display has no jitter or distortion when it is displayed on a TV picture (not on the blue background).

### ADJUSTMENT OF OSD HORIZONTAL SIZE

Measuring instrument	Oscilloscope and monitor TV
Mode	On screen display
Test point	VIDEO OUT jack
Control	C5901 Character position control
Specification	56 $\pm$ 1 $\mu$ sec

1. Connect the oscilloscope to the VIDEO OUT jack.
2. Press the ON SCREEN button on the remote control so that characters are displayed on the monitor screen.
3. Adjust C5901 so that the time period between the horizontal sync and last character is 56 $\mu$ sec as shown in Figure 2-19.
4. Make sure the position of the characters is not set to far left or right on the screen.

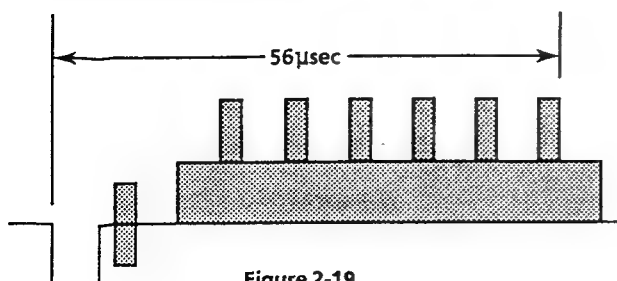


Figure 2-19.

- Location of controls and test points of terminal module

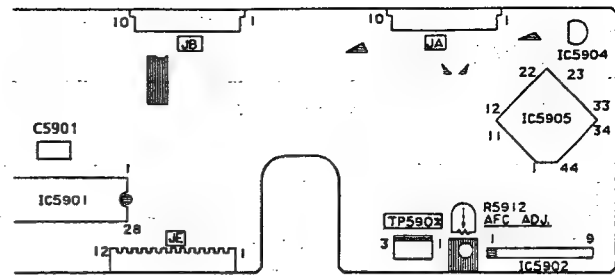


Figure 2-20.

### ADJUSTMENT OF AFT CIRCUIT

Measuring instrument	Oscilloscope VHF band AM signal generator
Mode	Good TV commercial broadcast reception
Input signal	PIF frequency uniwave signal
Test point	Pin ⑧ of IC1501 (Video output signal) Pin ⑤ of IC1501 (GND) Located on the tuner/IF module.
Control	AFT coil control
Specification	

1. Have the unit received good TV commercial broadcast reception. (Input field strength: 70 dB $\mu$ V of antenna terminal)
2. Using the VHF band AM signal generator, feed the PIF frequency (Figure 2-21) signal (sinewave) to the tuner/IF output terminal.
3. Connect an oscilloscope to pin ⑧ of IC1501 (Video output signal) and Pin ⑤ of IC1501 (GND).
4. Set the CHANNEL SET switch or button to the VHF or UHF position. Keep the tuning button (+) or (-) depressed until the desired broadcast channel comes in clearly on your TV, and beating on the oscilloscope screen be minimum. Set the CHANNEL SET switch or button on the set position.
5. Turn the core of the AFT coil for adjustment so that the beating on the oscilloscope screen becomes minimum. (The AFT coil is located on the IF unit.)



## PIF Frequency table

Version	Frequency
VC-H91/H91ETS VC-H96/H96ETS VC-H980/H980ETS	38.9MHz

Figure 2-21.

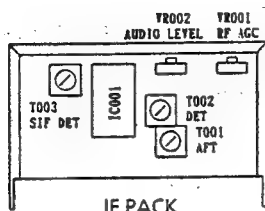


Figure 2-22.

## ADJUSTMENT OF RF AGC CIRCUIT

Measuring instrument	Oscilloscope
Mode	Good TV commercial broadcast reception (Split field colour bar signal)
Test point	Pin ⑧ of IC1501 (Video output signal) Pin ⑤ of IC1501 (GND) Located on the tuner/IF module
Control	VR001 AGC control
Specification	Just before shrinking (See Figure 2-23)

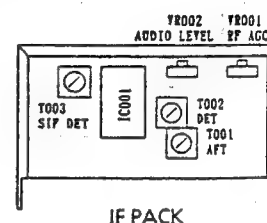


Figure 2-23.

## ADJUSTMENT OF AUDIO LEVEL

Measuring instrument	AC milli-voltmeter
Input signal	RF signal (at voice signal to 1kHz $\pm$ 50Hz deviation and the modulation factor to 100%)
Test point	Emitter of Q1509 ~ GND Located on the TUNER/IF module
Control	VR002 AUDIO LEVEL control
Specification	- 13 $\pm$ 2dBs

1. Receive the good RF signal reception of antenna terminal.
2. Connect a AC milli-voltmeter to Emitter of Q1509 and GND.
3. Adjustment VR002 (AUDIO LEVEL control) so that the milli-voltmeter reads - 13dBs.

### ● Location of controls and test points of TUNER/IF module

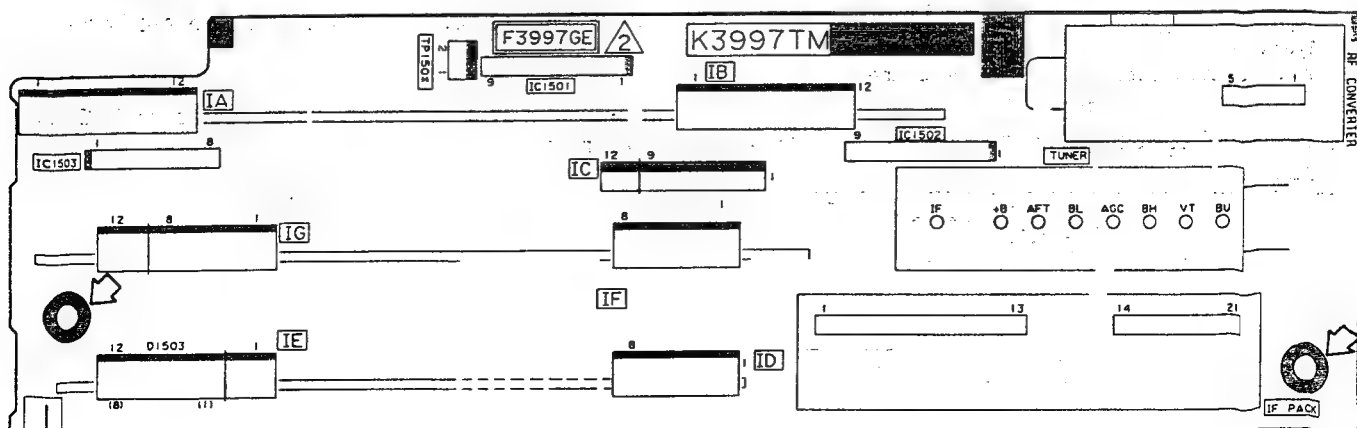


Figure 2-24.

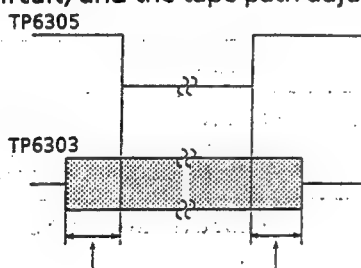




## CHECKING OF AUDIO HEAD SWITCHING POINT

Measuring instrument	Dual-trace oscilloscope
Mode	Playback
Cassette	Alignment tape (VROCBFFS)
Test point	TP6305 (Signal) ~ TP6306 (GND) (Audio head switching pulse)
	TP6303 (Signal) ~ TP6306 (GND) (Playback envelope)
Specification	More than 100μsec

1. Connect a dual-trace oscilloscope with delayed sweep to test points TP6305 (Signal) ~ TP6306 (GND) (Audio head switching pulse) and TP6303 (Signal) ~ TP6306 (GND) (Playback envelope).
2. Play the alignment tape (VROCBFFS).
3. Using delayed sweep, observe the waveform around the timing of leading edge and trailing edge of the audio head switching pulse.
4. Make sure that the envelope on test points TP6303 (Signal) ~ TP6306 (GND) is at least 100μsec wider than the audio head switching pulse at both edges as shown in Figure 2-31. If it is out of specified value, verify the HEAD SWITCHING POINT adjustment (Servo adjustment circuit) and the tape path adjustment.



More than 100μsec  
Figure 2-31.

## CHECKING OF LINEAR AUDIO PLAYBACK LEVEL

Measuring instrument	AC milli-voltmeter
Mode	Playback
Input signal	Alignment tape (VROCPSV) (1kHz level control signal)
Test point	AUDIO OUT jack
Specification	- 12 ± 2dBs (at RCA Jack)

1. Play back the alignment tape. (VROCPSV 1kHz level control signal)
2. Connect an AC milli-voltmeter to the AUDIO OUT jack.
3. Make sure that the output level is - 12 ± 2dBs (at RCA Jack).

## ADJUSTMENT OF LINEAR AUDIO BIAS CURRENT

Measuring instrument	AC milli-voltmeter
Mode	Record (PAL)
Input signal	Not required
Test point	TP6301 (+) ~ TP6302 (-)
Control	R6306 Bias current control
Specification	2.2 ± 0.1mVrms

1. Connect the AC milli-voltmeter to test points TP6301 (+) and TP6302 (-). (Use TP6302 for ground lead.)
2. Set the unit in recording mode.
3. Adjust R6306 so that the bias current is 2.2 ± 0.1mVrms.
4. Record and play a TV program and make sure the audio is not distorted.

## CHECKING OF LINEAR AUDIO BIAS LEAK

Measuring instrument	AC milli-voltmeter or oscilloscope
Mode	Record
Input signal	Not required
Test point	AUDIO OUT jack
Control	
Specification	Below - 20dBs or 220mVp-p

1. Select channel "AV" to in A/V input mode and put the unit in record mode. Do not feed any signal to AUDIO IN jack
2. Connect an AC milli-voltmeter or oscilloscope to the AUDIO OUT jack.
3. Make sure the bias leak is below - 20dBs or 220mVp-p.

## CHECKING OF ERASE VOLTAGE AND OSCILLATION FREQUENCY

Measuring instrument	Oscilloscope
Mode	Record
Test point	Full erase head
Control	T6301 Bias oscillation transformer
Specification	70 ± 10kHz, 40Vp-p or greater

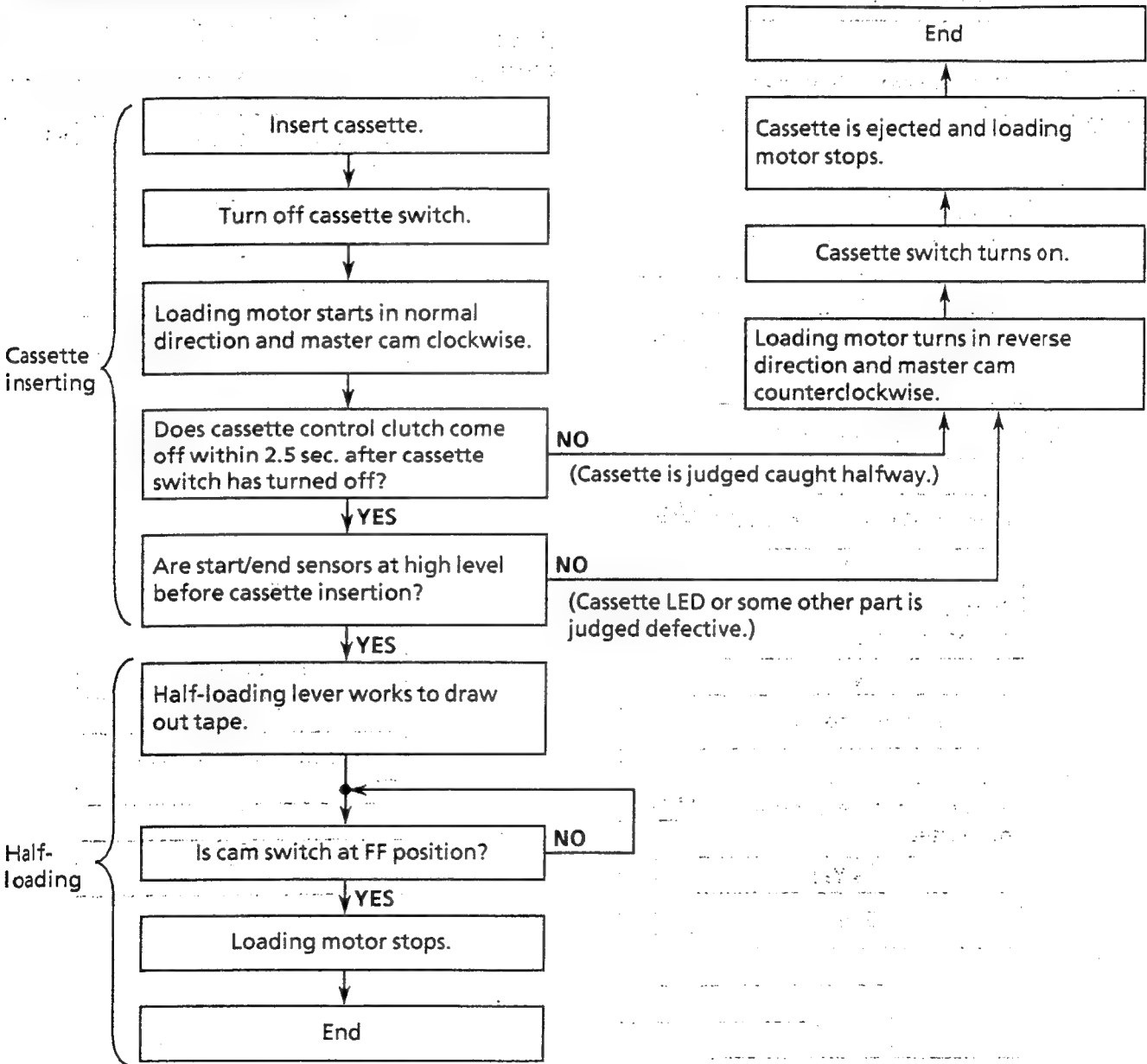
1. Put the unit in record mode.
2. Connect an oscilloscope across the full erase head.  
"(White: signal, Gray: ground)" is correct.
3. Make sure the erase voltage across the full erase head is approx. 40Vp-p or more and frequency is 70 ± 10kHz.

# MECHANISM OPERATION FLOW CHART AND TROUBLESHOOTING GUIDE

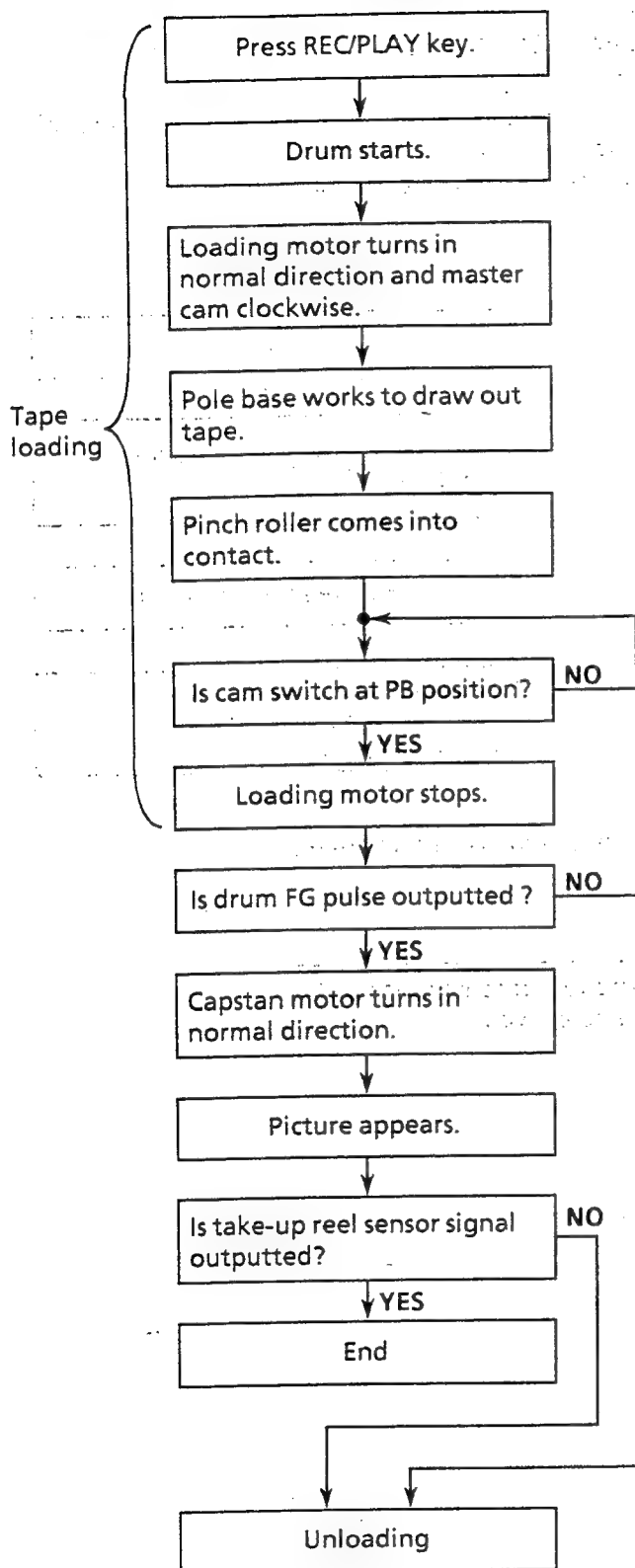
## MECHANISM OPERATION FLOW CHART

- \* This flow chart describes the outline of the mechanism's operation, but does not give its details.
- \* For cam switch positions, see Fig. 3-2.

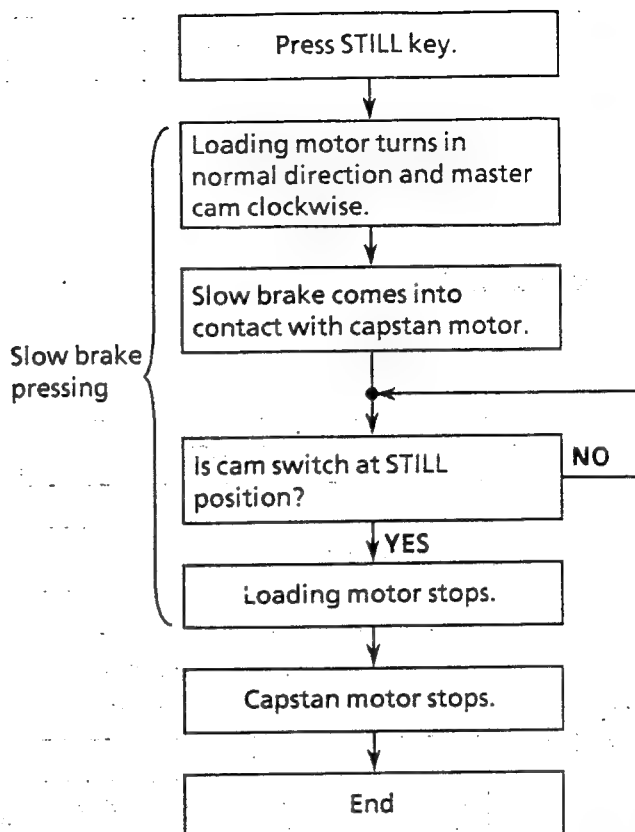
### CASSETTE INSERTION → STOP



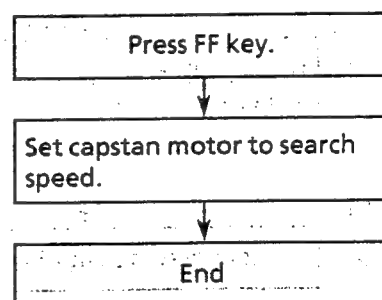
STOP → REC/PLAY

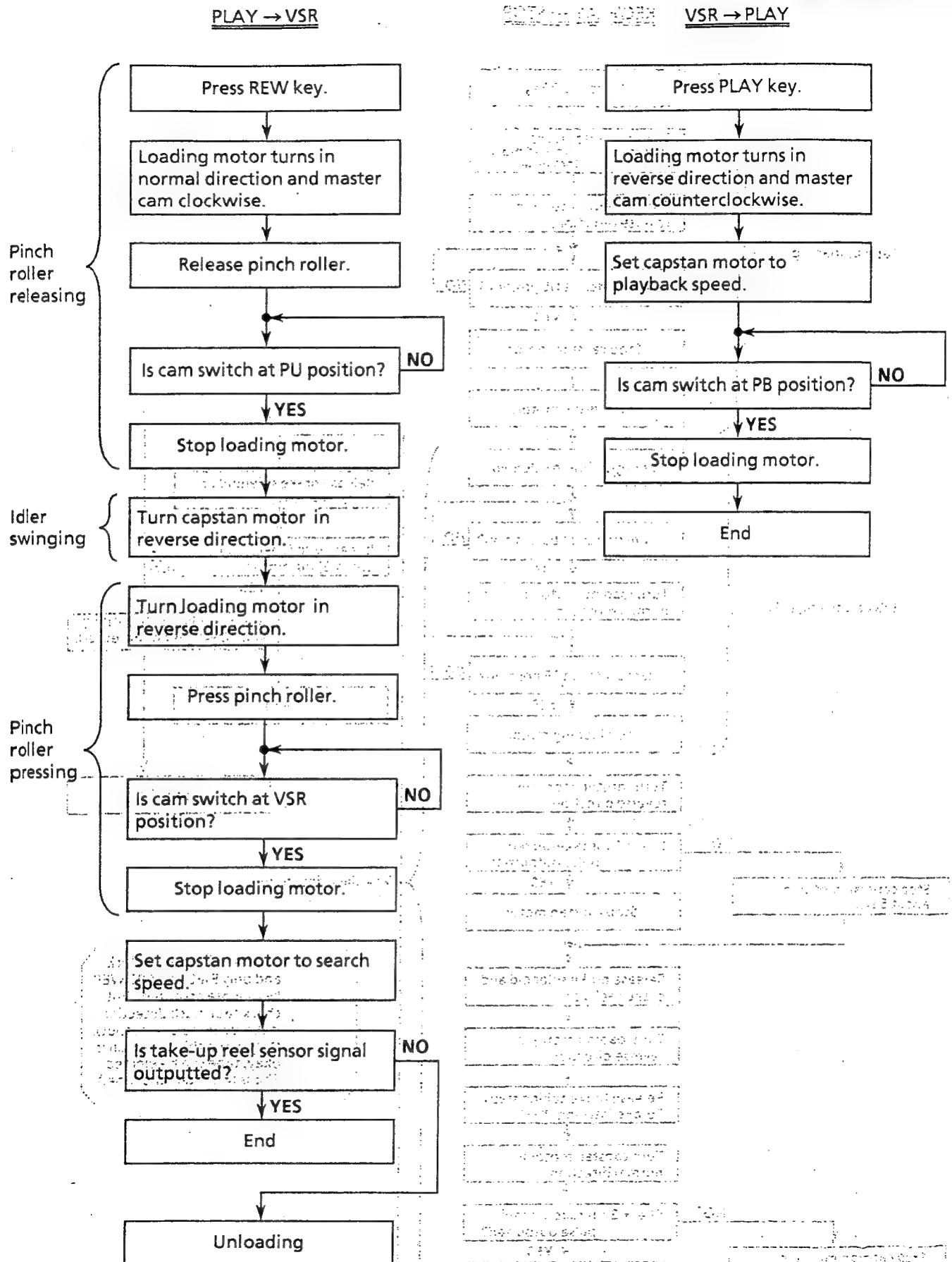


PLAY → STILL

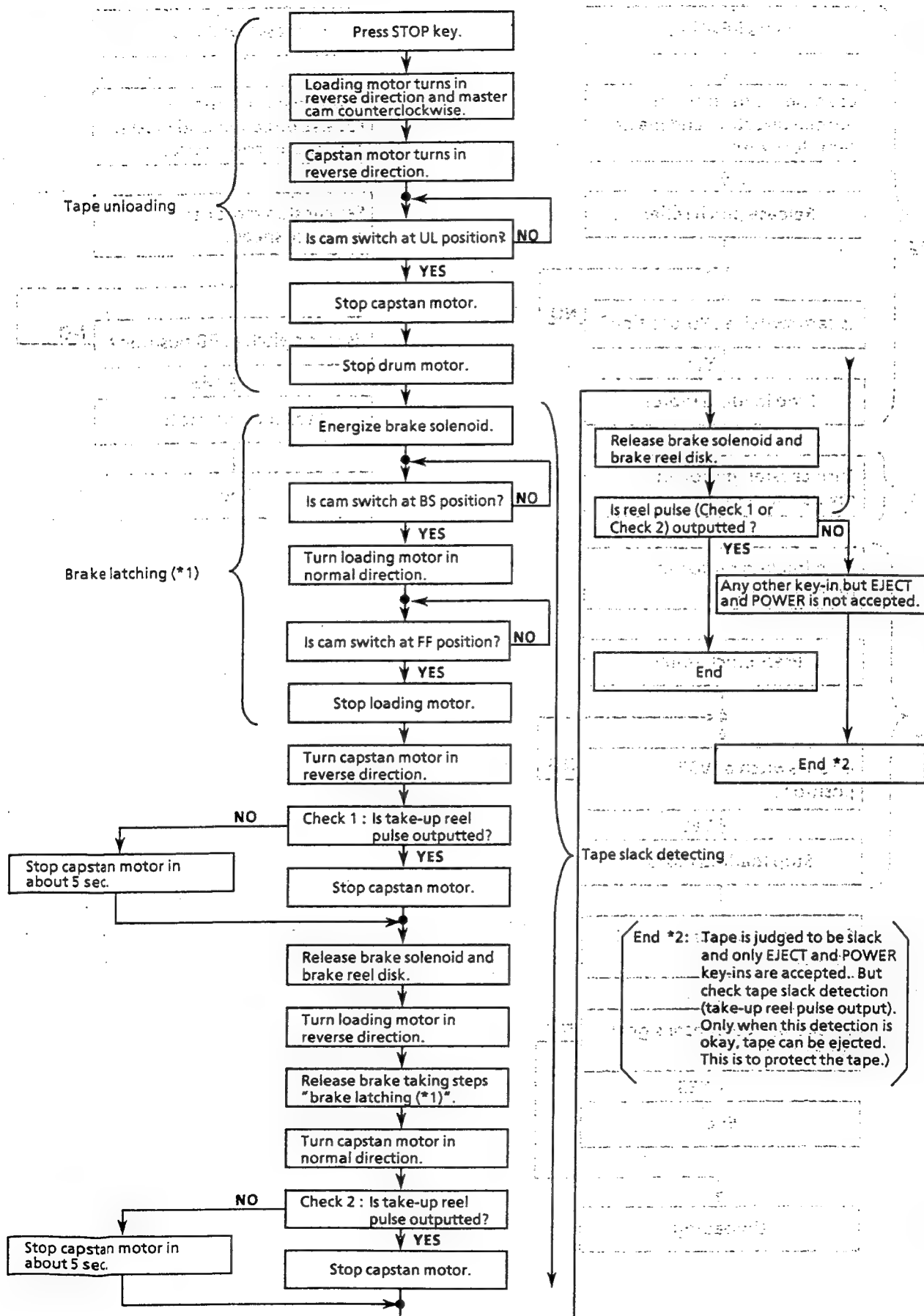


PLAY → VSF

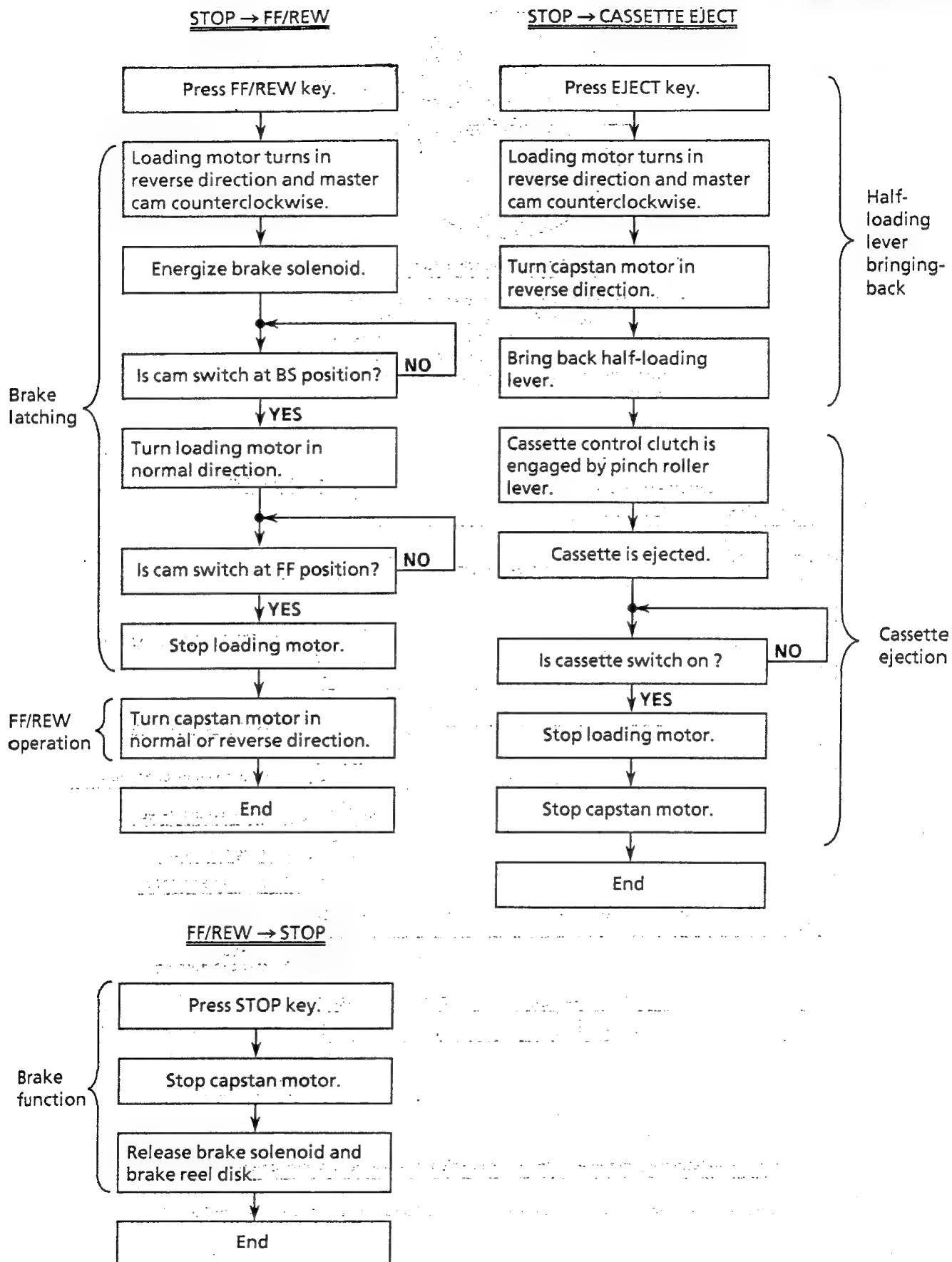




REC/PLAY → STOP







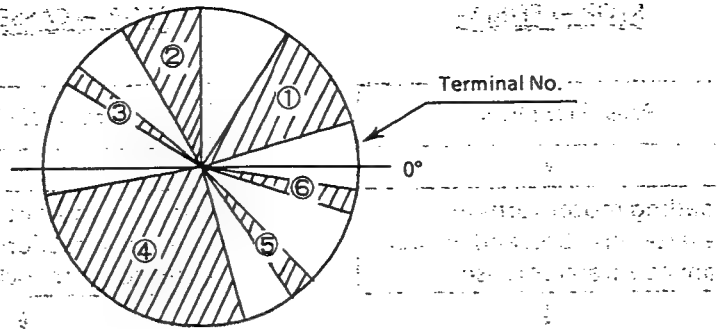


Fig. 3-1: Cam switch pattern

\* The cam switch has the pattern as shown in Fig. 3-1. The circuit turns on when the signal comes on the shaded zones on the switch. The six pattern signals are judged to be on or off by the system controller in order to detect the mechanism modes.

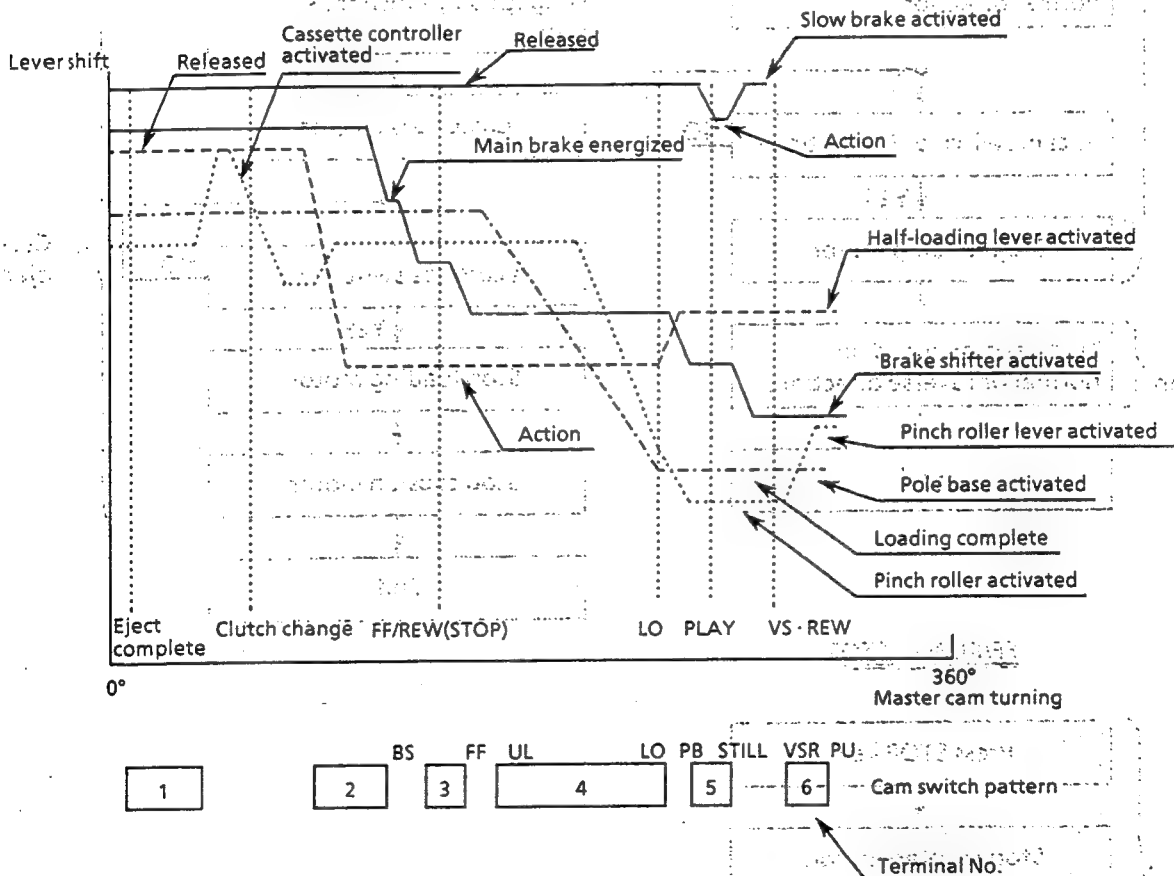
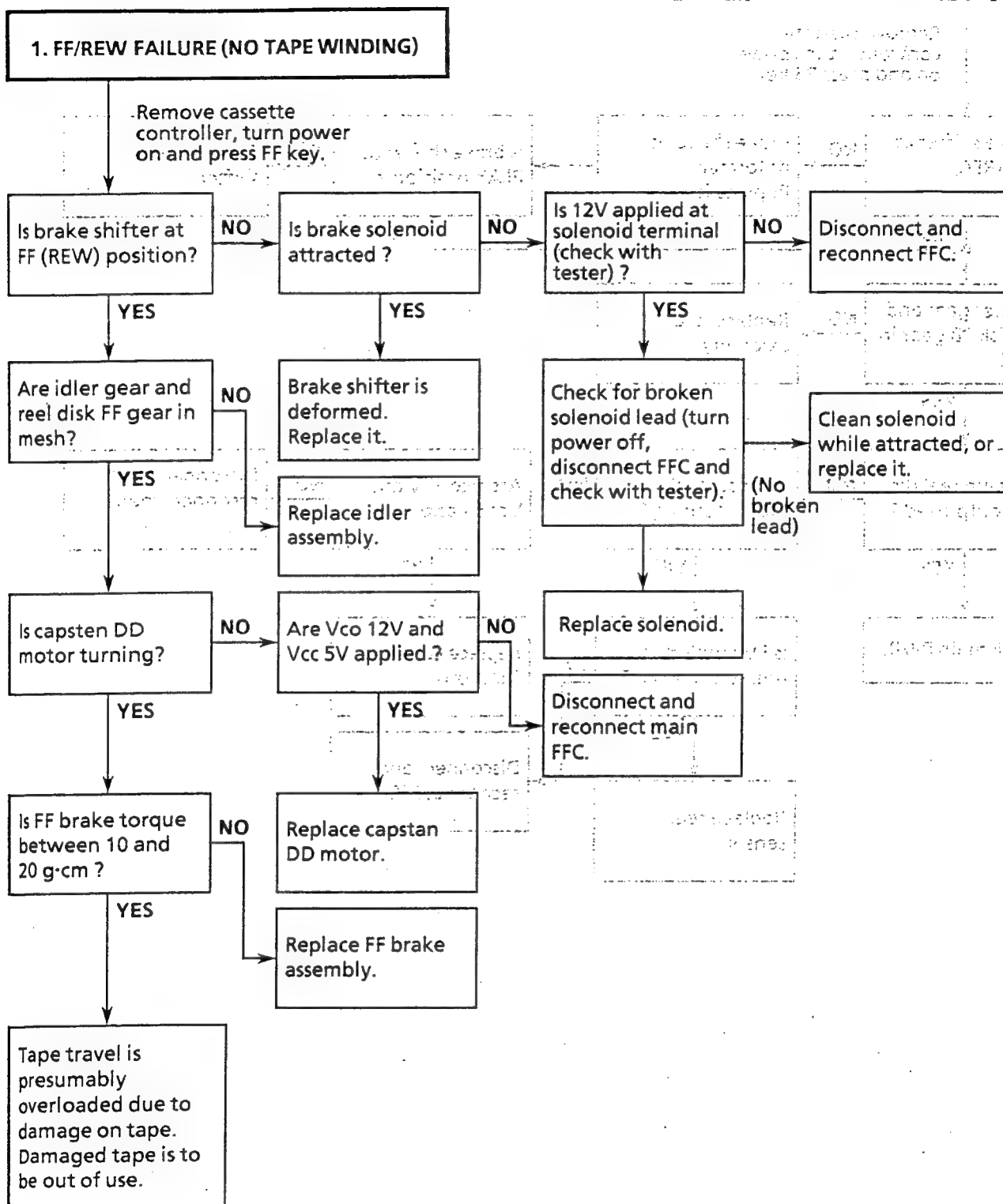
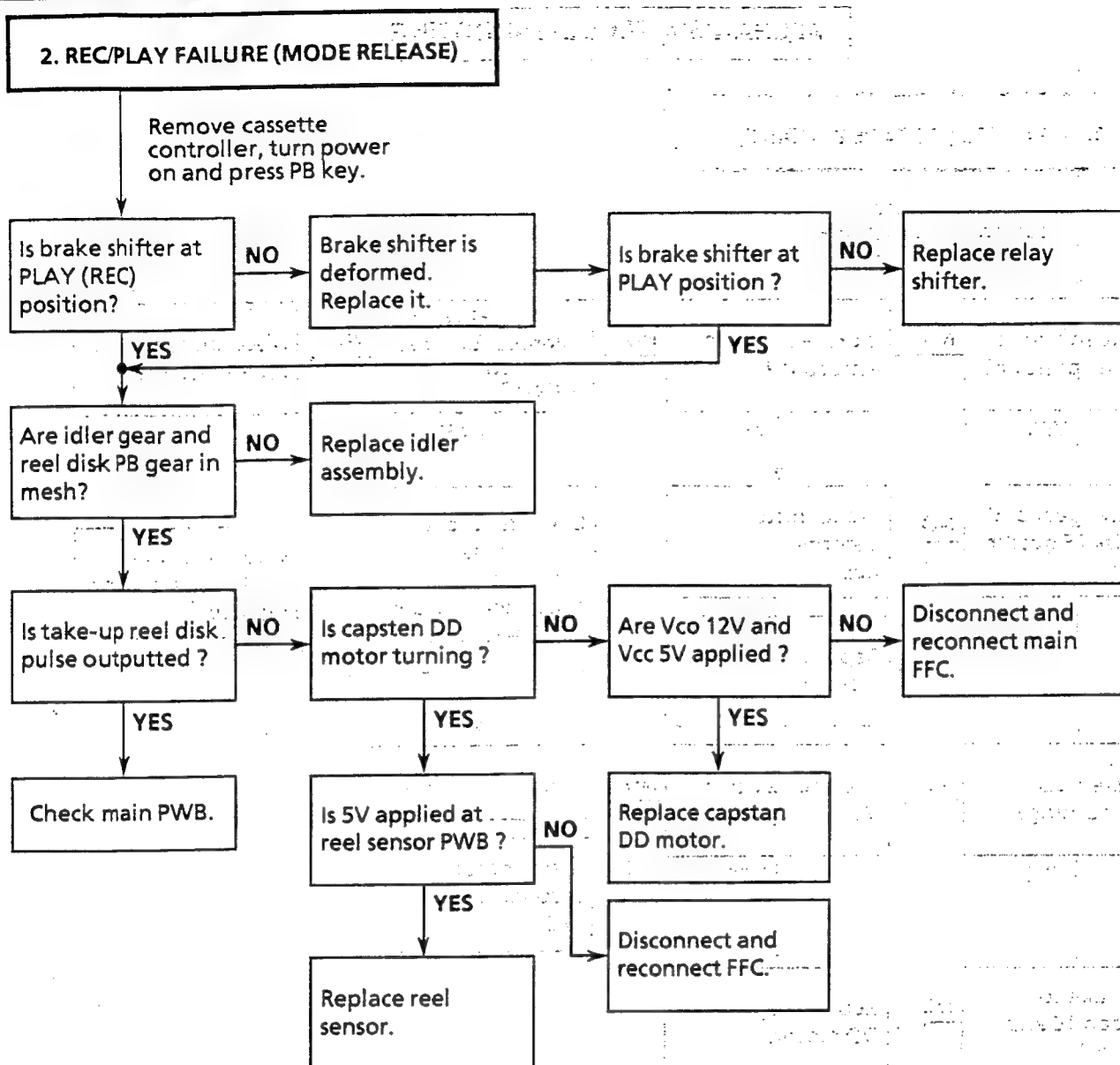


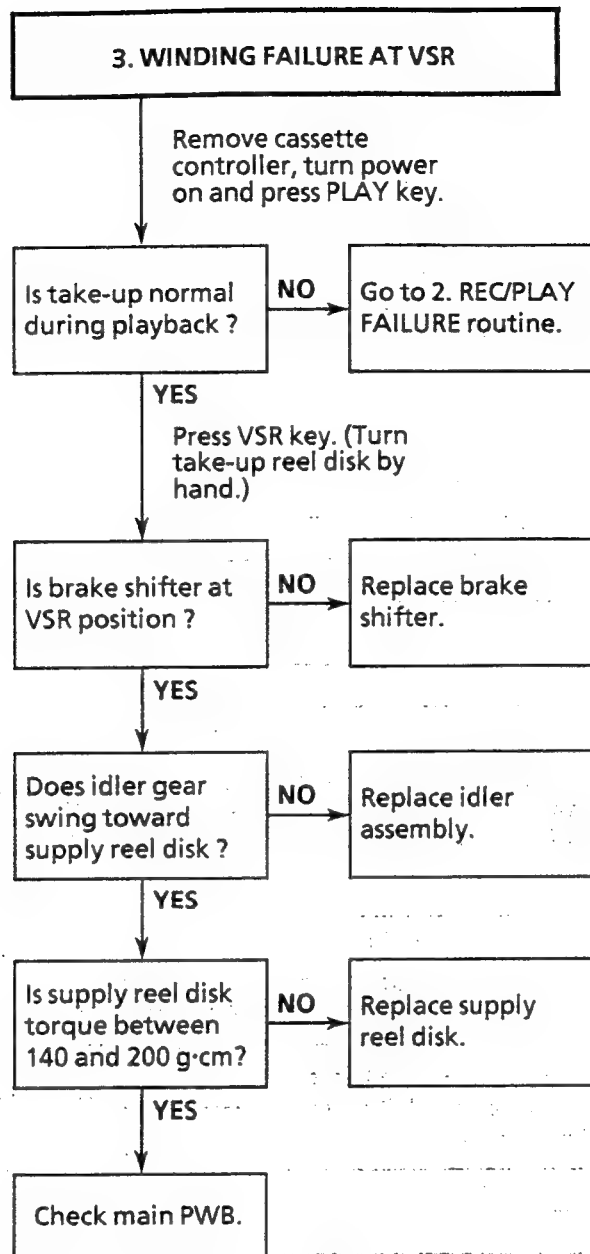
Fig. 3-2 Relationship between cam switch positions and mechanism movement

The relationship between the cam switch positions and the mechanism movement is shown in Fig. 3-2.

## MECHANISM TROUBLESHOOTING







#### 4. UNUSUAL SOUND IN EACH MODE

Insert cassette and press  
PLAY and STOP keys  
repeatedly.

Is rattling sound heard  
during loading/  
unloading ?

NO

Replace L block sub-  
assembly. (L block  
= loading block)

YES

Turn power off and remove  
cassette controller.

Is reel disk height as  
specified (using jig) ?

NO

Readjust reel disk height.

YES

Power ON  
FF key IN

Is unusual sound heard at  
FF ?

YES

Turn take-up reel disk  
slowly with finger. Are  
take-up reel stopper and  
PB gear rubbing each  
other ?

NO

Replace take-up reel  
stopper.

NO

Press REW key and turn  
take-up reel disk by hand.

YES

Undo reel belt, turn take-up  
disk by hand and press FF key.

Is unusual sound heard at  
REW ?

YES

Is unusual sound heard  
with capstan DD motor  
running ?

YES

Replace capstan DD  
motor.

NO

NO

Move supply reel disk up  
and down. Is there  
excessive thrust gap ?

NO

Replace supply reel  
stopper.

YES

Turn supply reel disk  
slowly. Is there no  
rubbing at bottom ?

NO

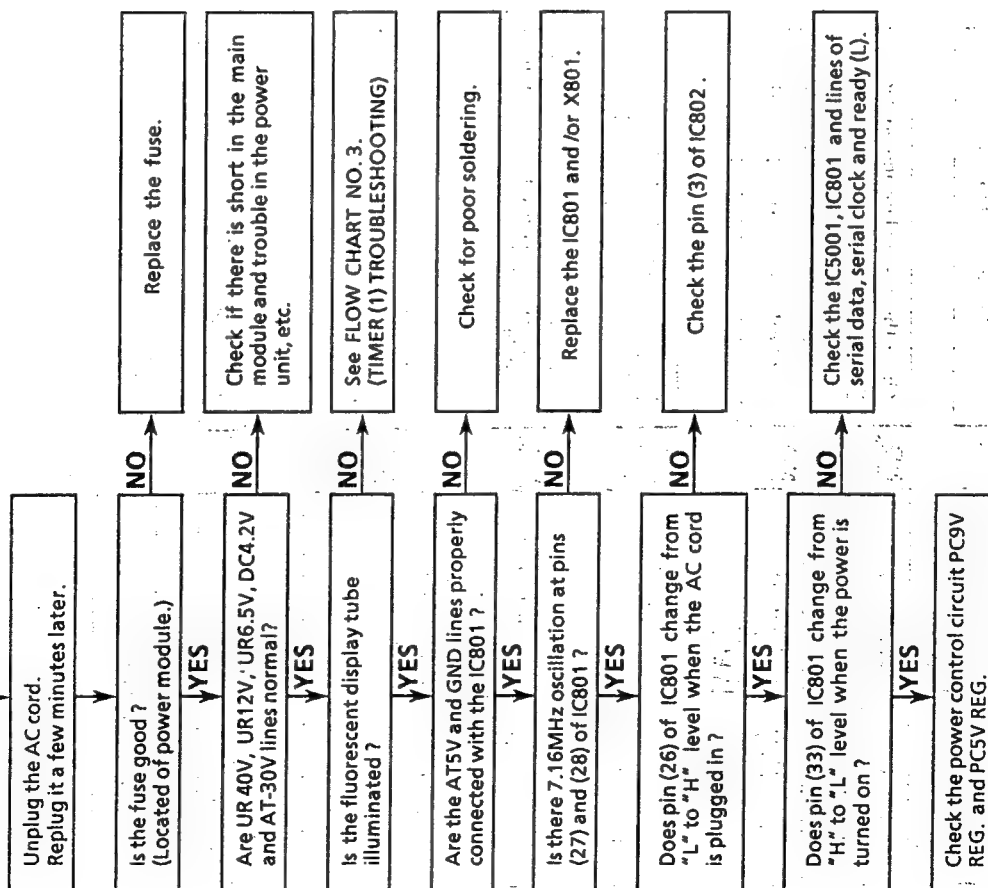
Replace supply reel disk.

YES

If there is no unusual  
sound heard again in  
each mode, go back to  
the start of routine to  
recheck.

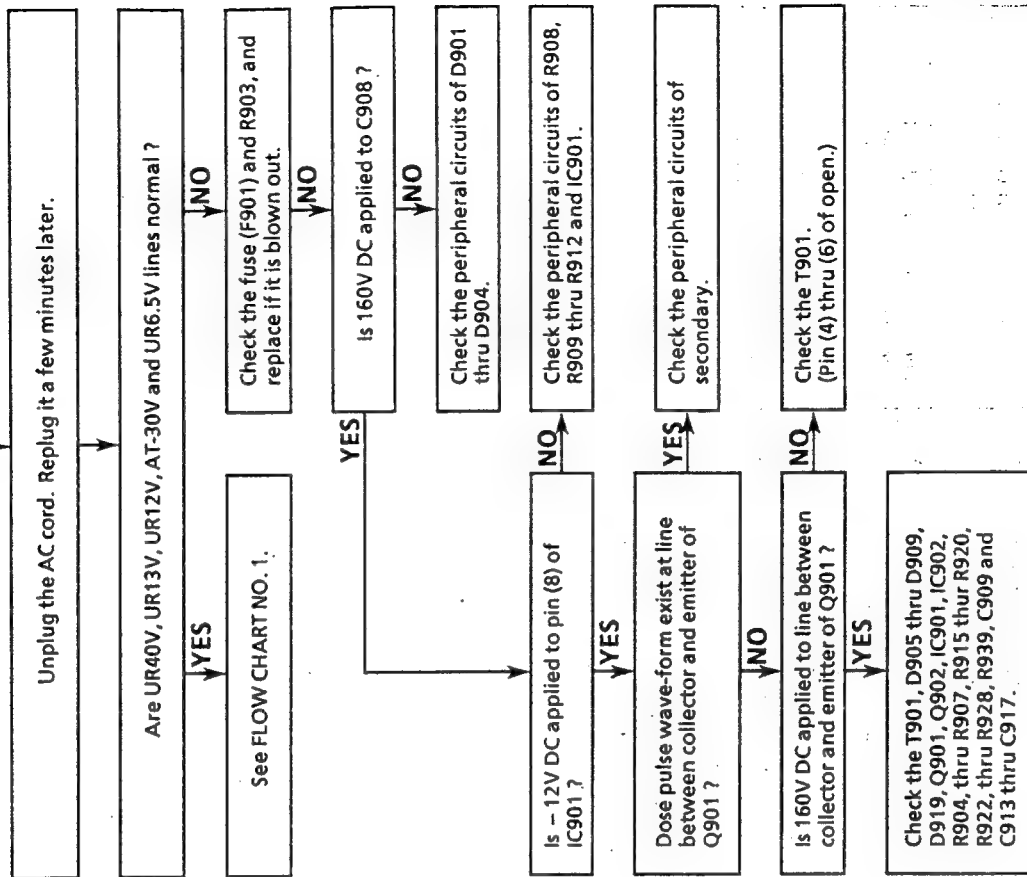
## FLOW CHART NO.1 POWER TROUBLESHOOTING

The VCR set fails to work.



## FLOW CHART NO. 2 POWER TROUBLESHOOTING

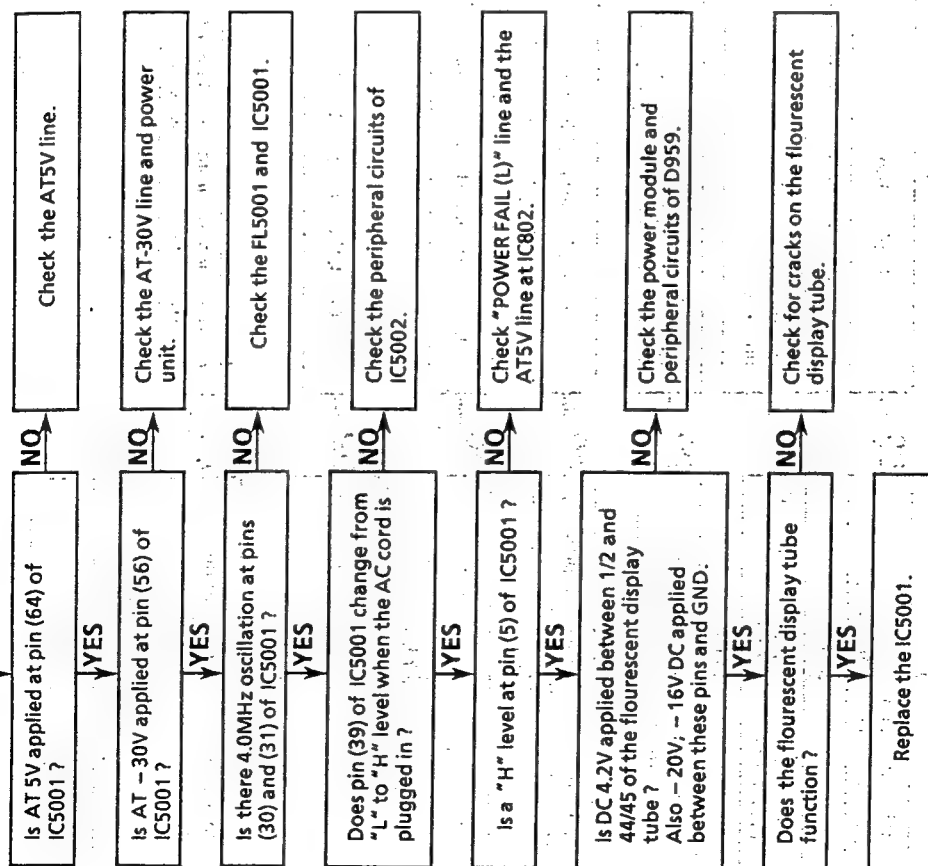
Set not operating.





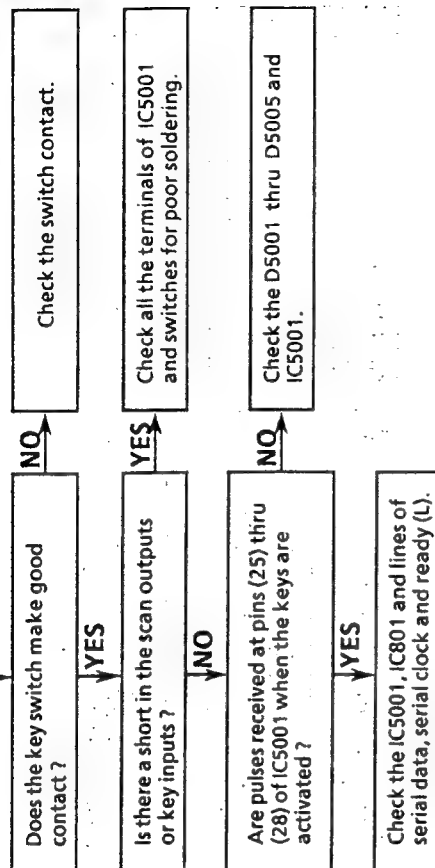
# FLOW CHART NO. 3 TIMER (1) TROUBLESHOOTING

The flourescent display tube fails to light up.



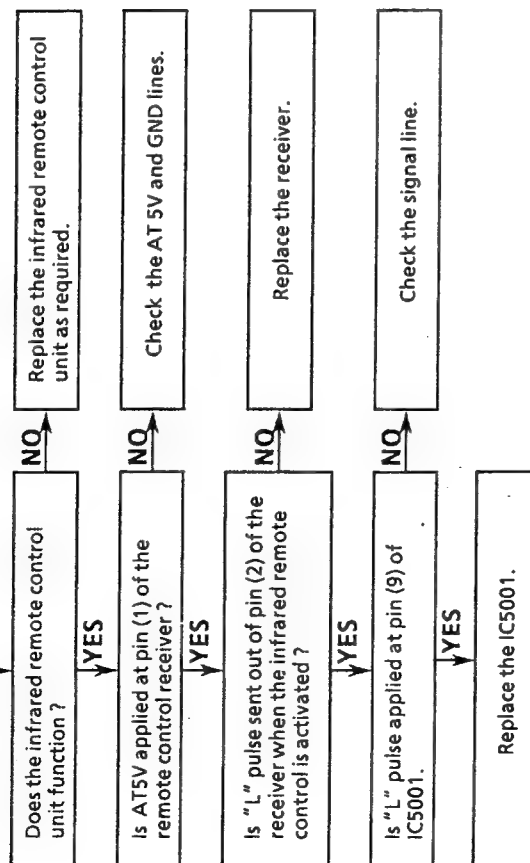
# FLOW CHART NO. 4 TIMER (2) TROUBLESHOOTING

Key-in input is not received.



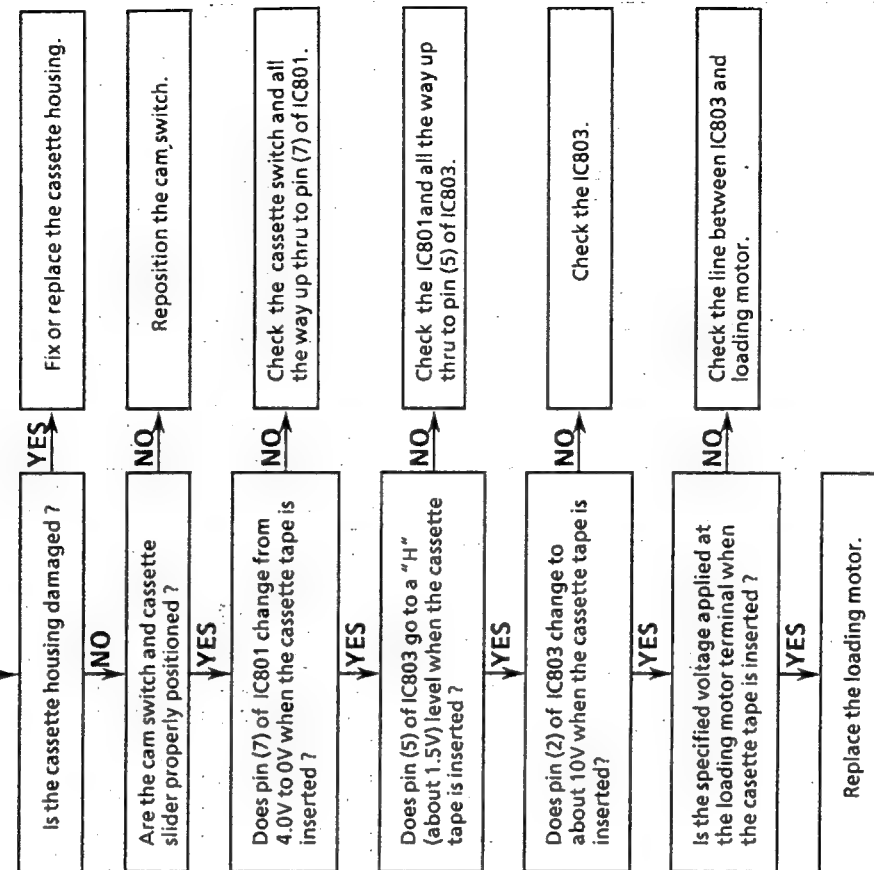
# FLOW CHART NO. 5 INFRARED R/C TROUBLESHOOTING

No operation is possible from the infrared remote control.

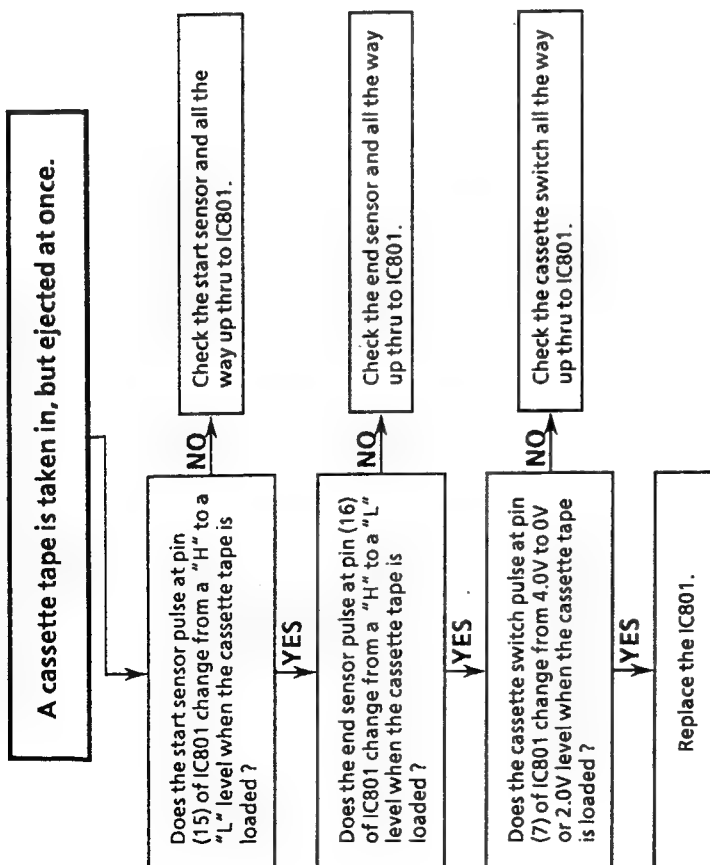


# FLOW CHART NO. 6 CASSETTE CONTROL TROUBLESHOOTING (1)

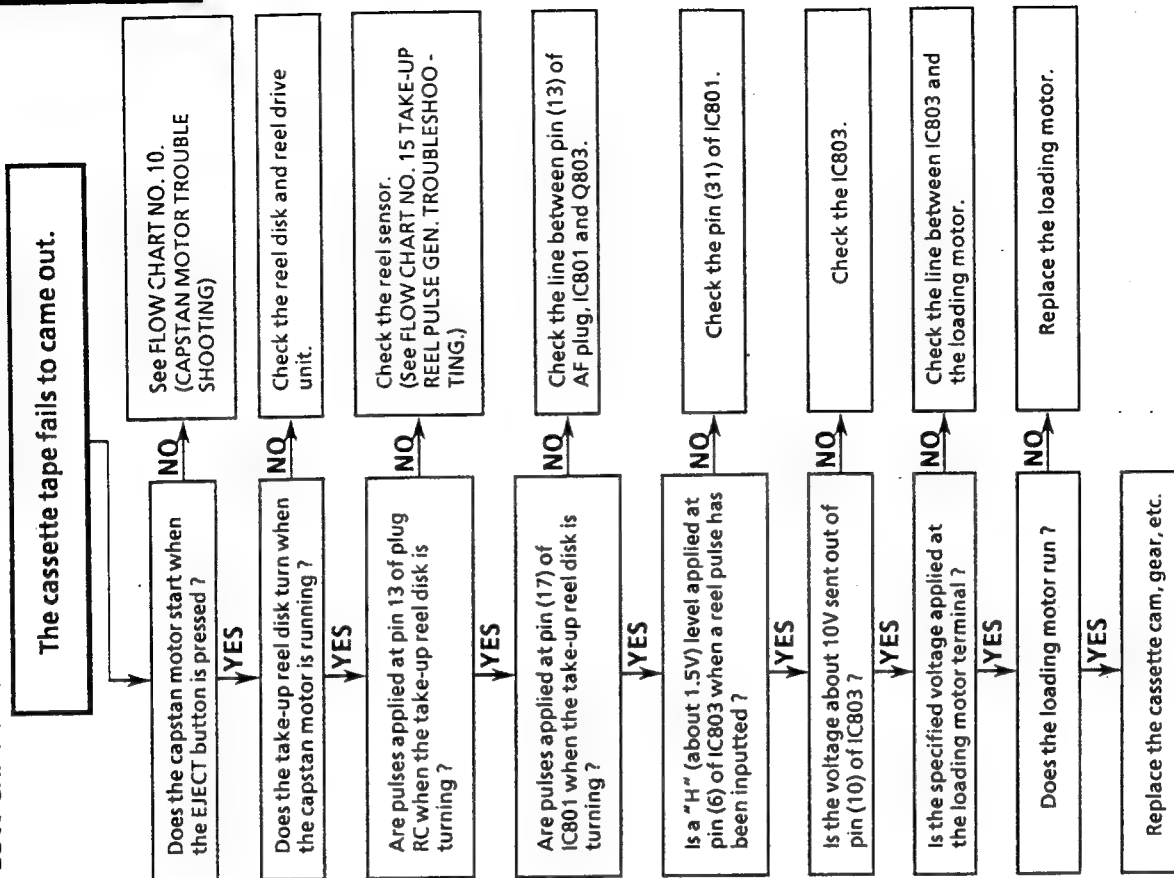
A cassette tape is not take in.



# FLOW CHART NO. 7 CASSETTE CONTROL TROUBLESHOOTING (2)

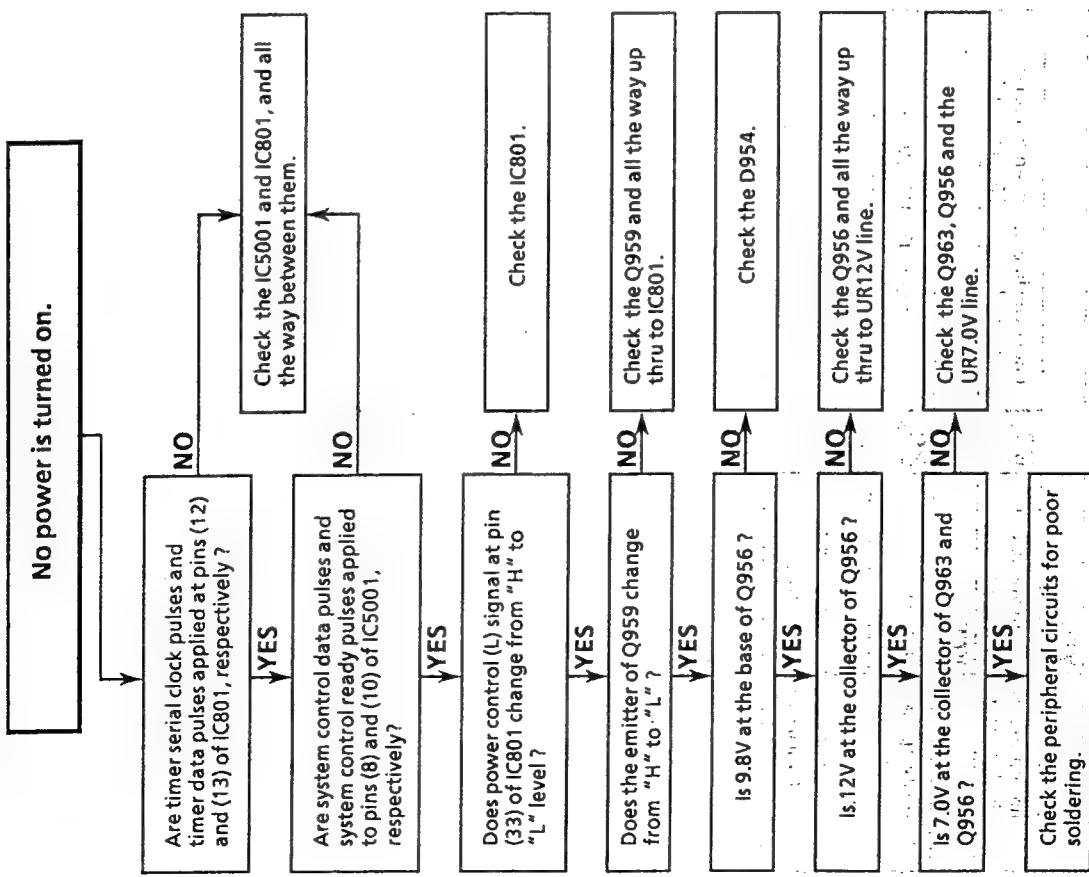


# FLOW CHART NO. 8 LOADING MOTOR AND EJECT TROUBLESHOOTING

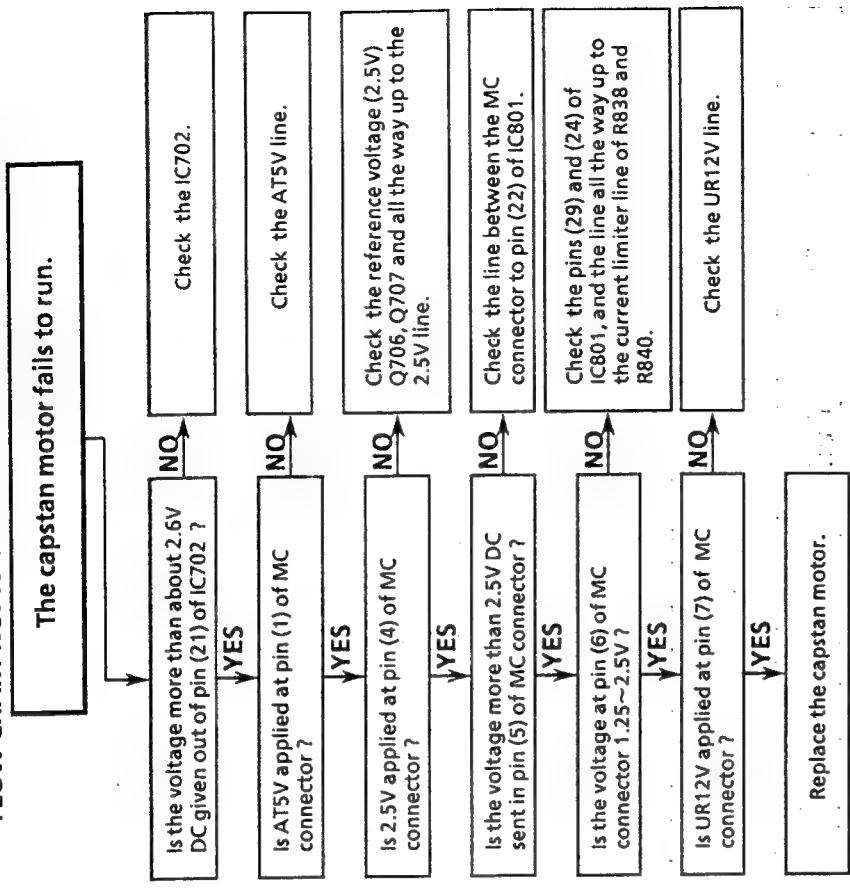


H91/H91ETS  
H96/H96ETS  
H980/H980ETS

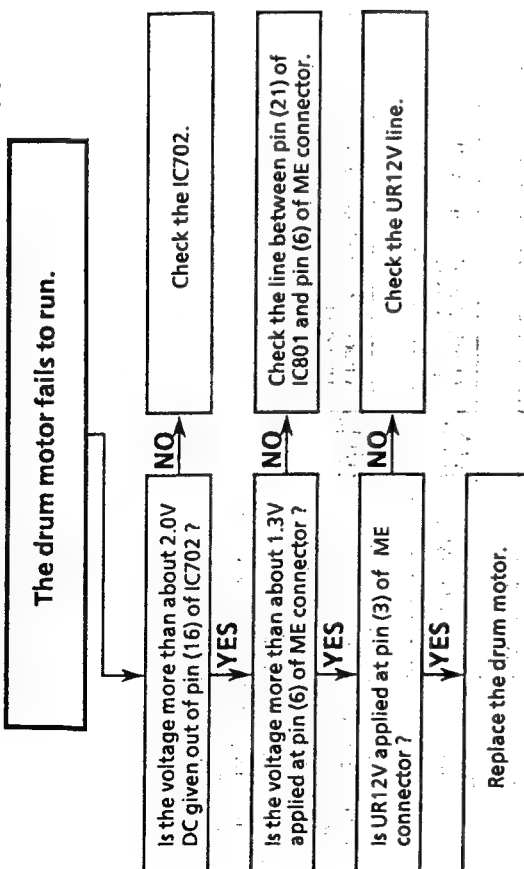
FLOW CHART NO. 9 SYSTEM CONTROL TROUBLESHOOTING



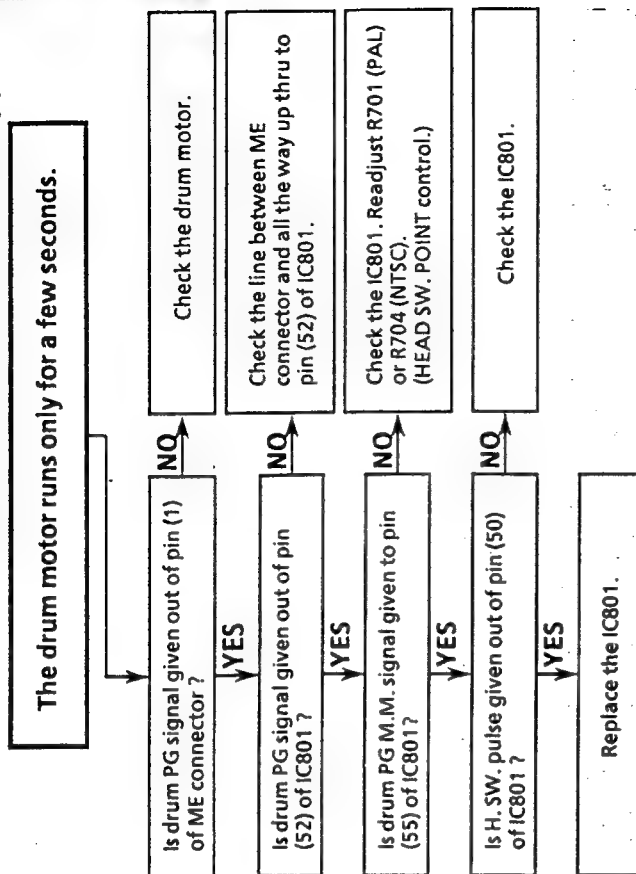
FLOW CHART NO. 10 CAPSTAN MOTOR TROUBLESHOOTING



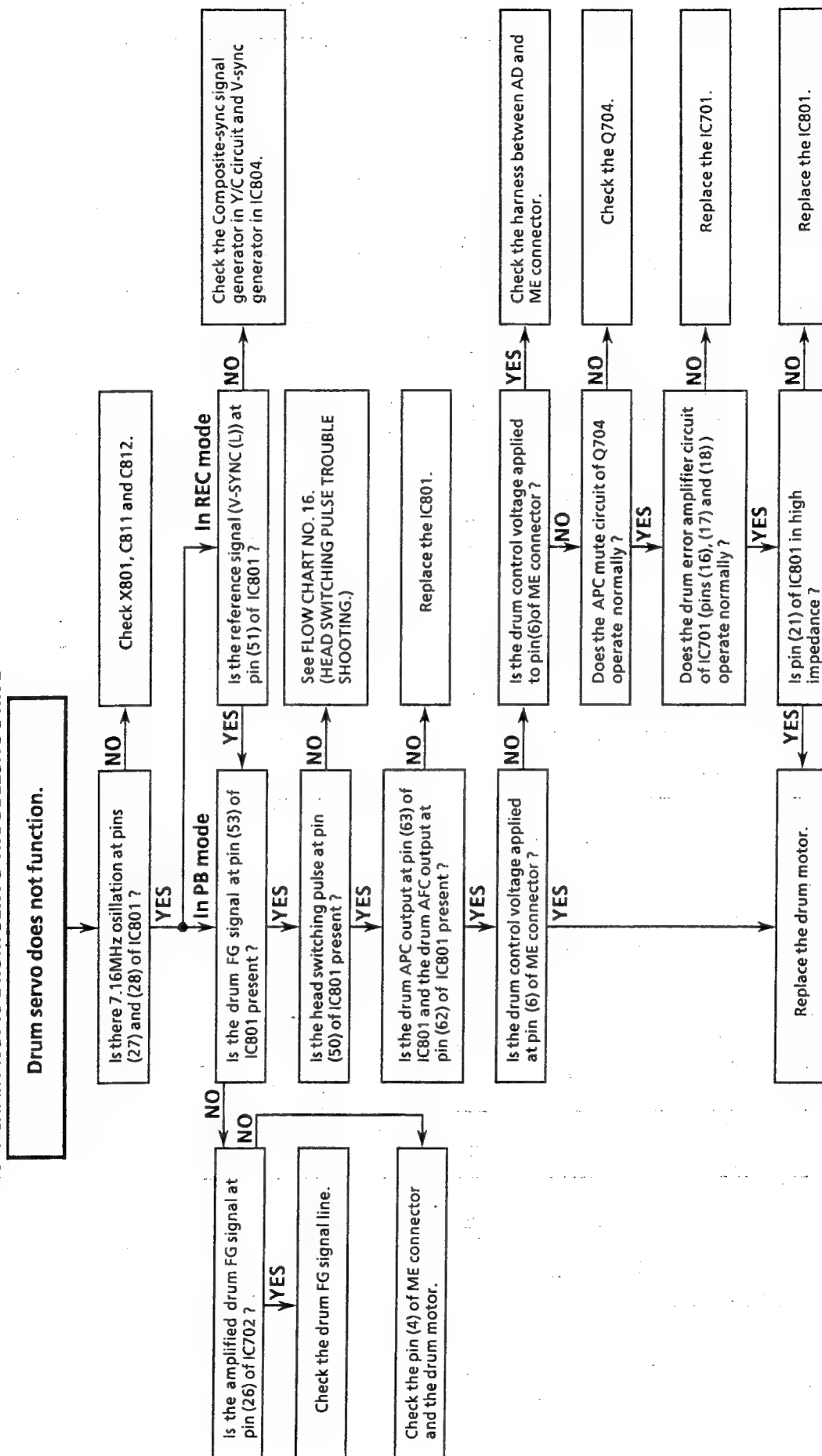
# FLOW CHART NO. 11 DRUM MOTOR TROUBLESHOOTING (1)



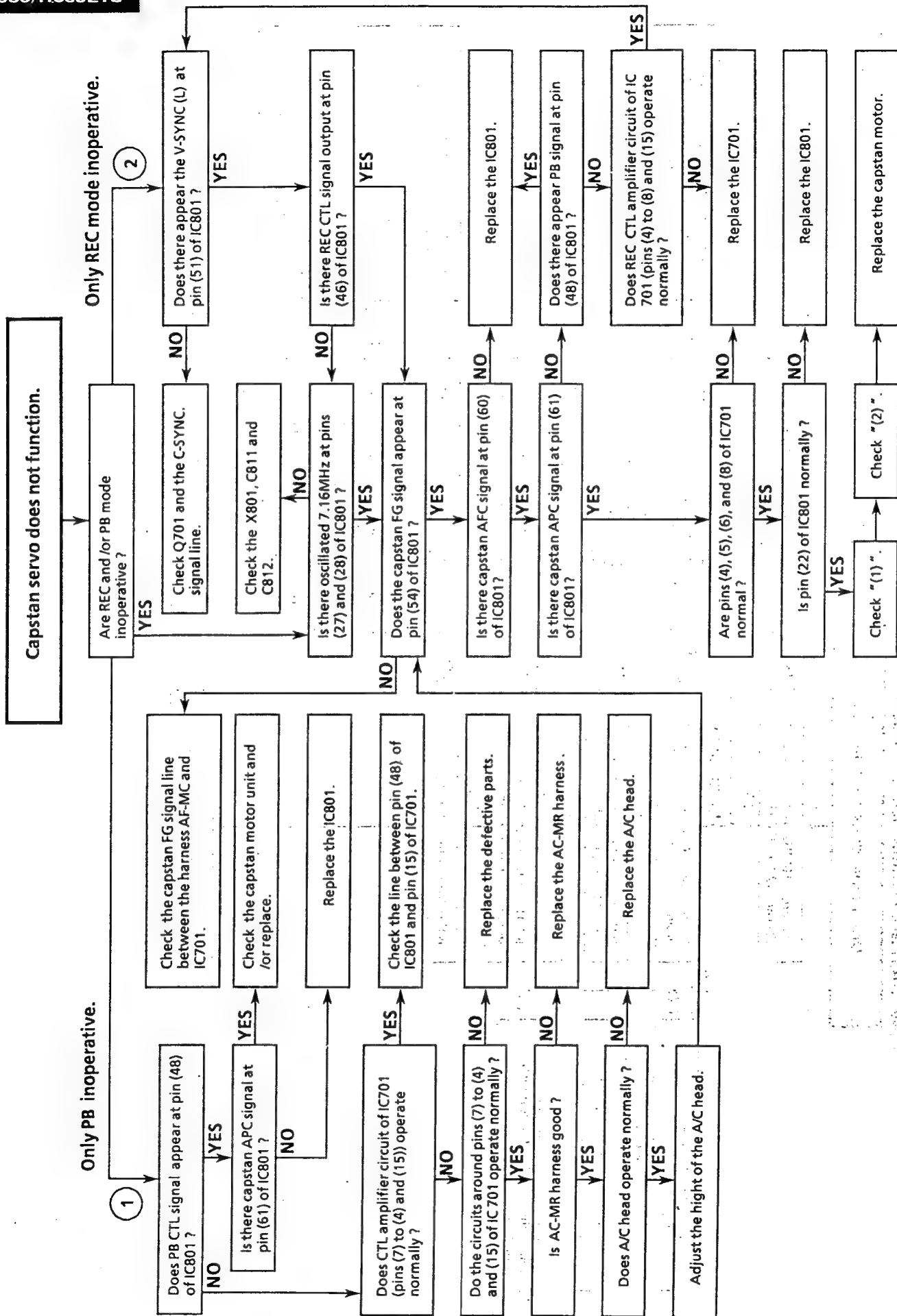
# FLOW CHART NO. 12 DRUM MOTOR TROUBLESHOOTING (2)



FLOW CHART NO. 13 DRUM SERVO TROUBLESHOOTING



# FLOW CHART NO. 14 CAPSTAN SERVO TROUBLESHOOTING



# FLOW CHART NO. 15 TAKE-UP REEL PULSE GENERATOR TROUBLESHOOTING

Note:

CONTINUED TO FLOW CHART NO.8 LOADING MOTOR AND EJECT TROUBLESHOOTING

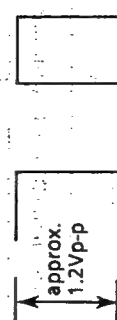
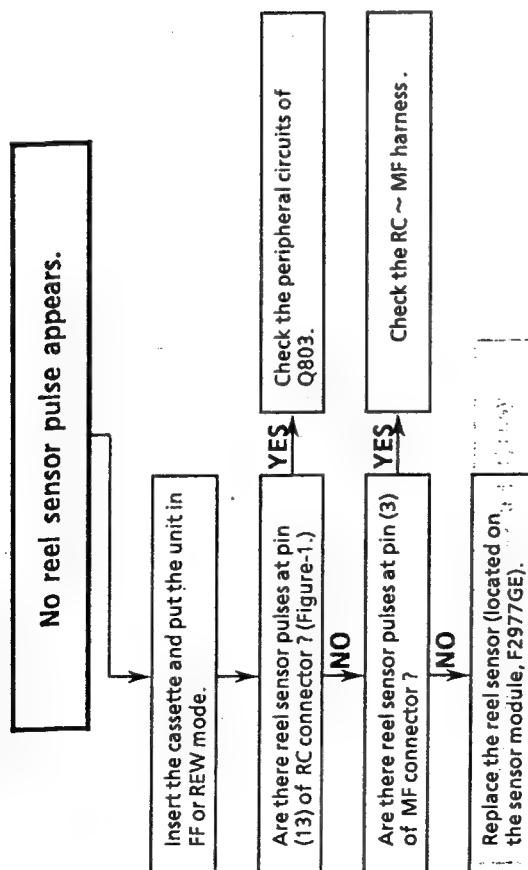


Figure-1.



Figure-2.

# FLOW CHART NO. 16 HEAD SWITCHING PULSE TROUBLESHOOTING

Note:

CONTINUED TO FLOW CHART NO.13 DRUM SERVO TROUBLESHOOTING

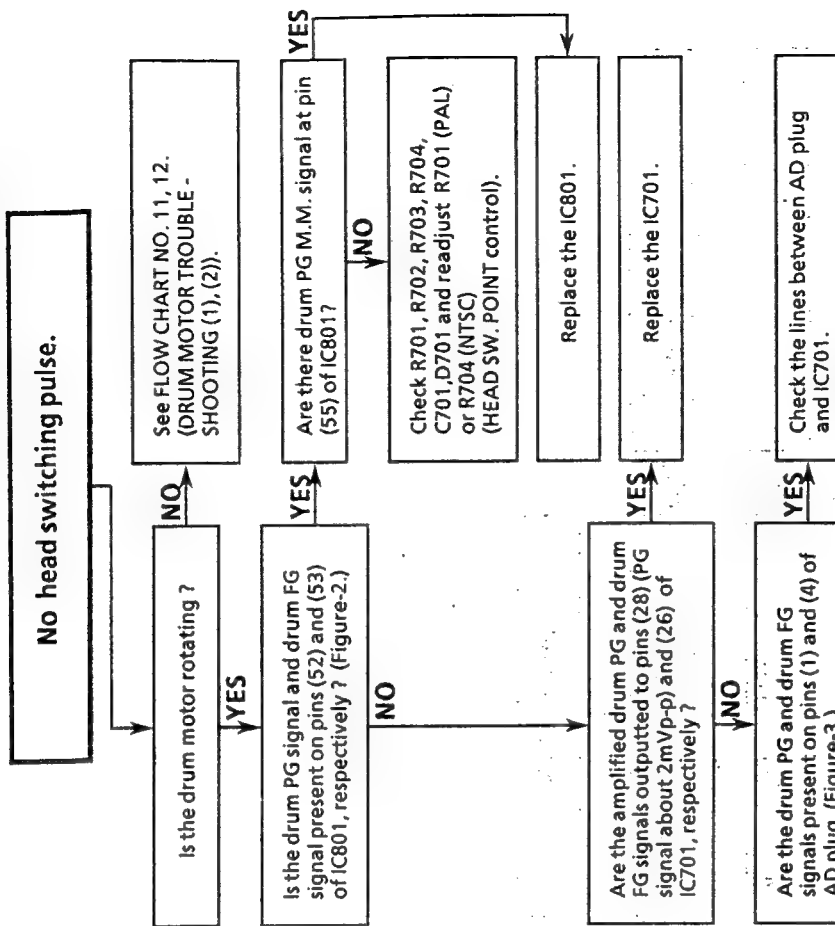
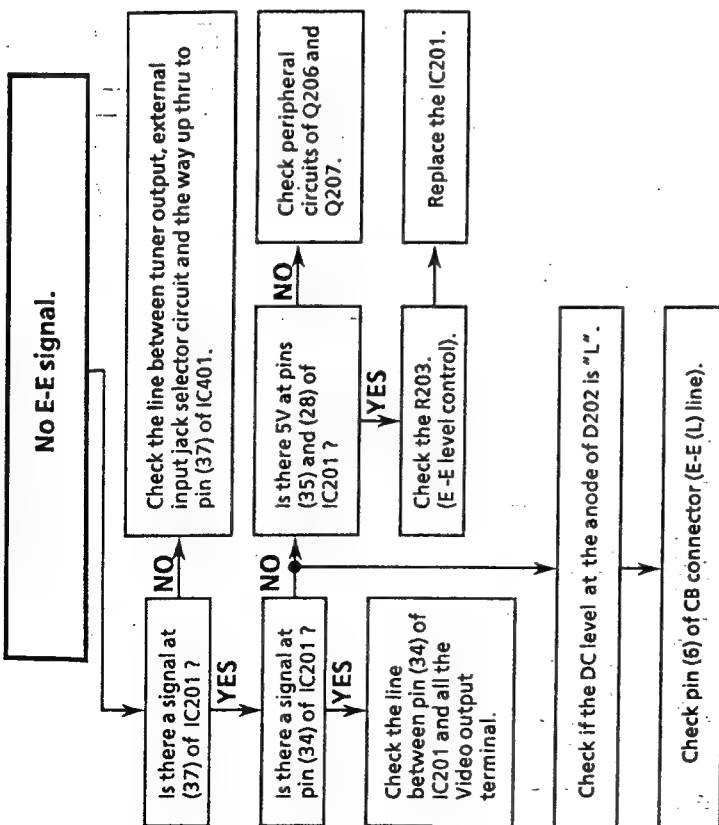


Figure-3.

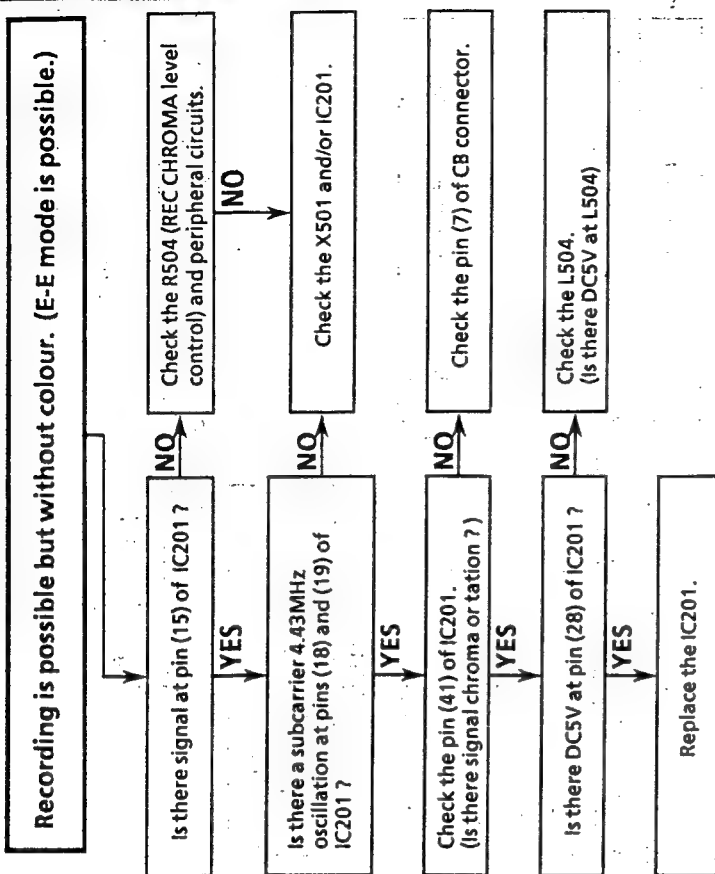
VC-H91/H91ETS  
VC-H96/H96ETS  
VC-H980/H980ETS



# FLOW CHART NO. 17 E-E MODE TROUBLESHOOTING

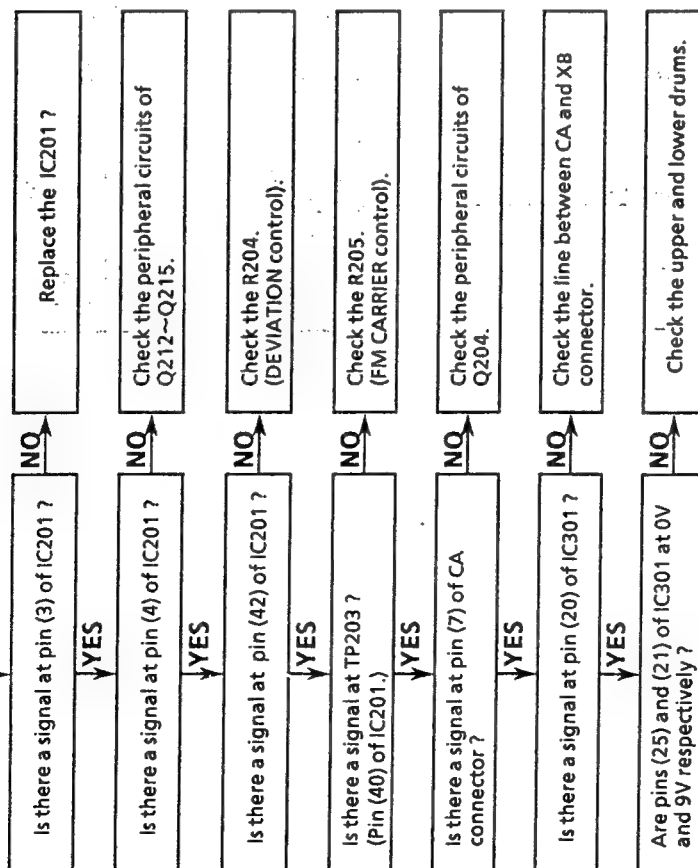


# FLOW CHART NO. 18 RECORDING MODE (CHROMA) TROUBLESHOOTING



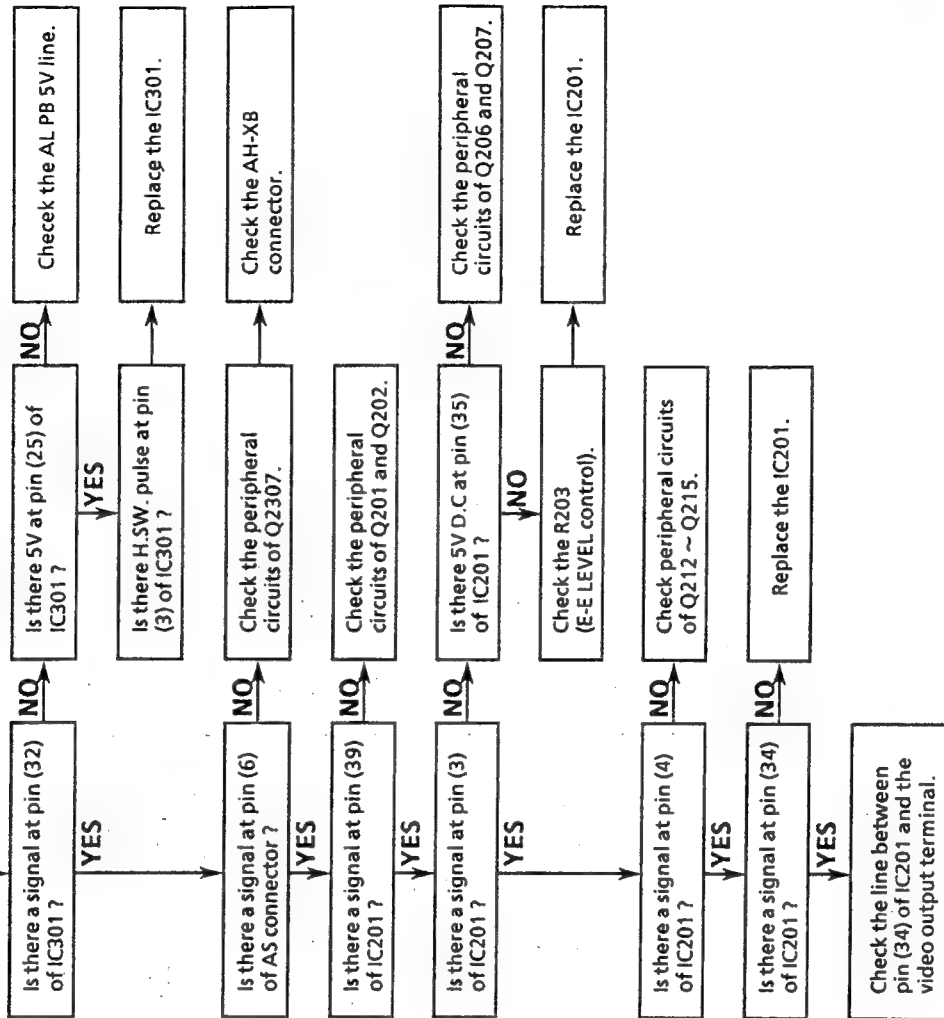
# FLOW CHART NO. 19 RECORDING MODE (LUMINANCE) TROUBLESHOOTING

Recording is not possible. (E-E mode is possible.)



# FLOW CHART NO. 20 PLAYBACK MODE (LUMINANCE) TROUBLESHOOTING

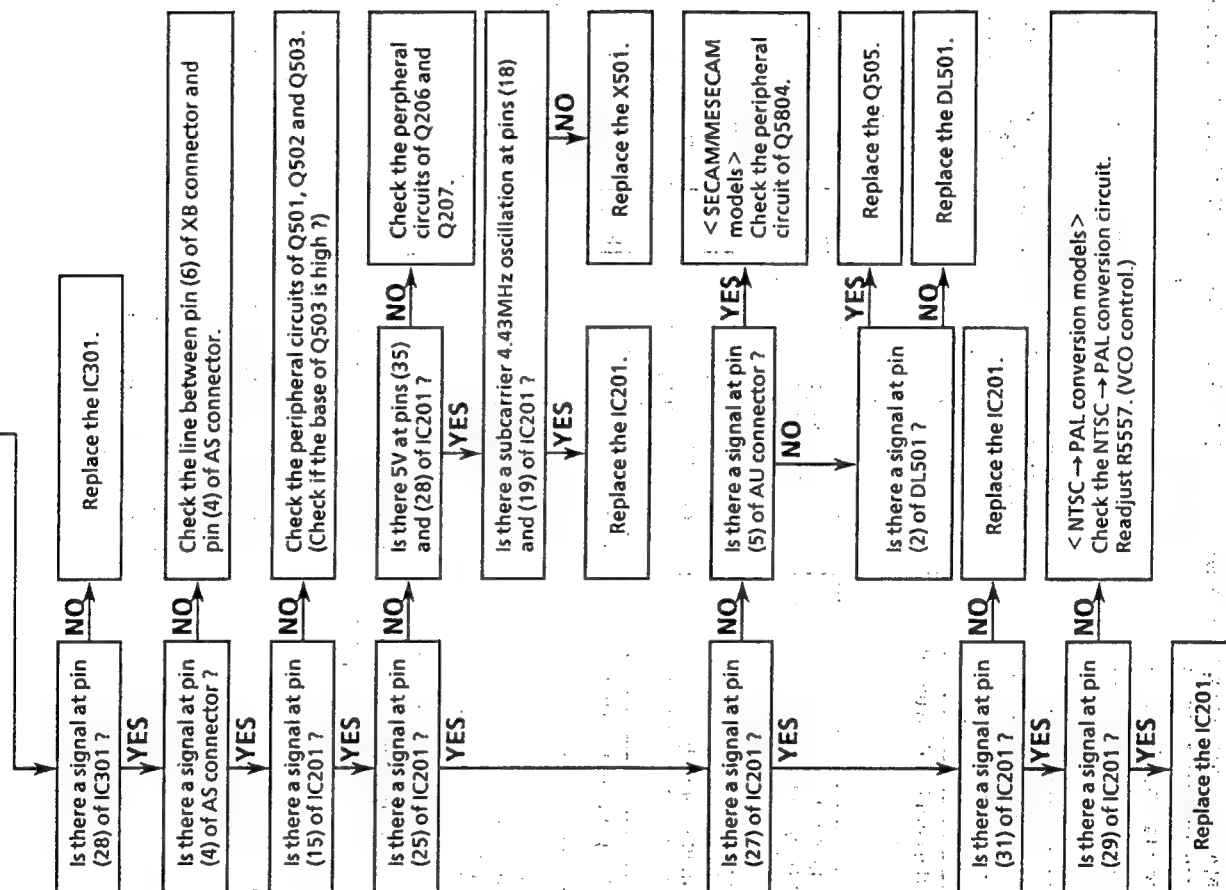
Playback is not possible.



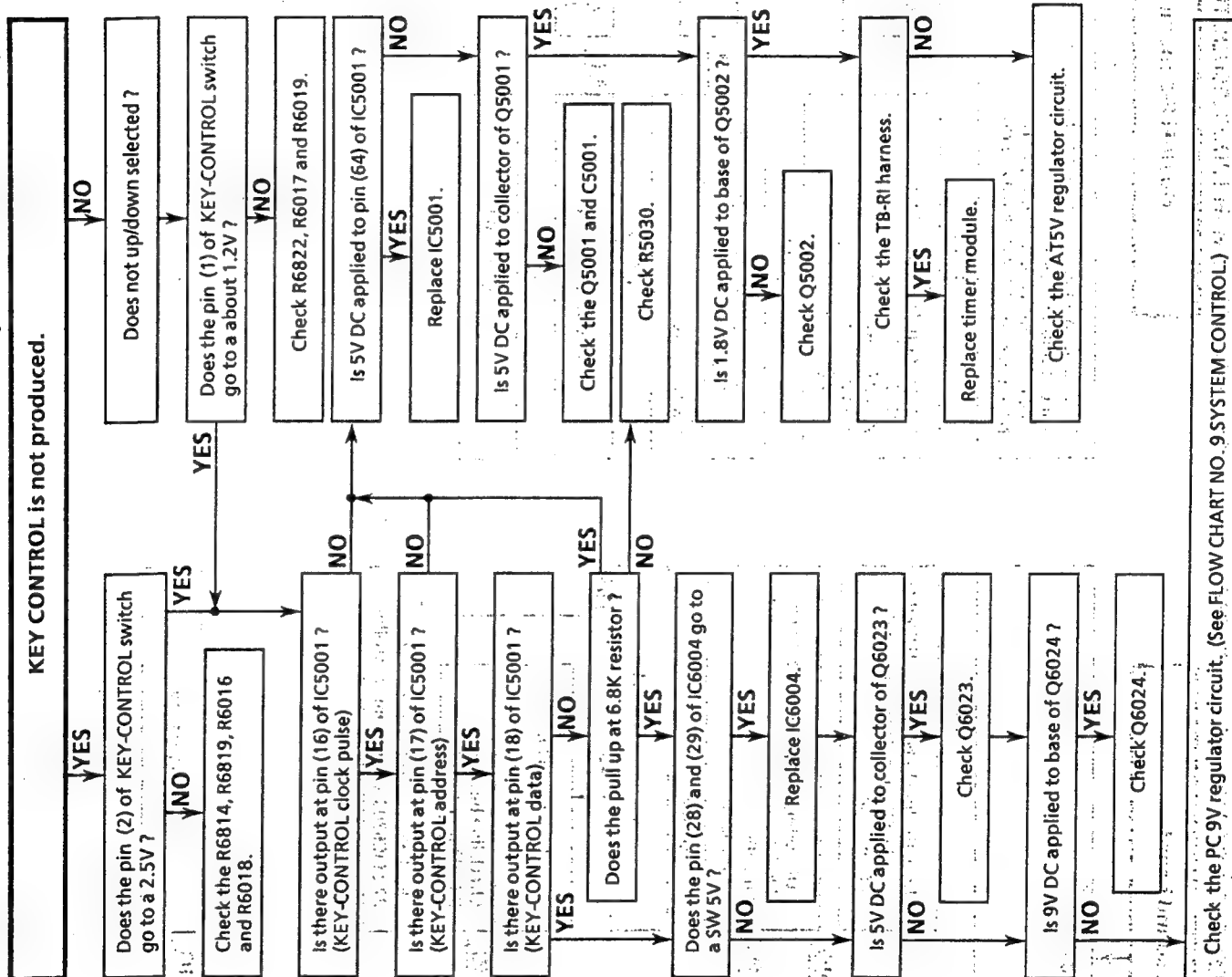
VC-H91/H91ETS  
VC-H96/H96ETS  
VC-H980/H980ETS

# FLOW CHART NO. 21 PLAYBACK MODE (CHROMINANCE) TROUBLESHOOTING

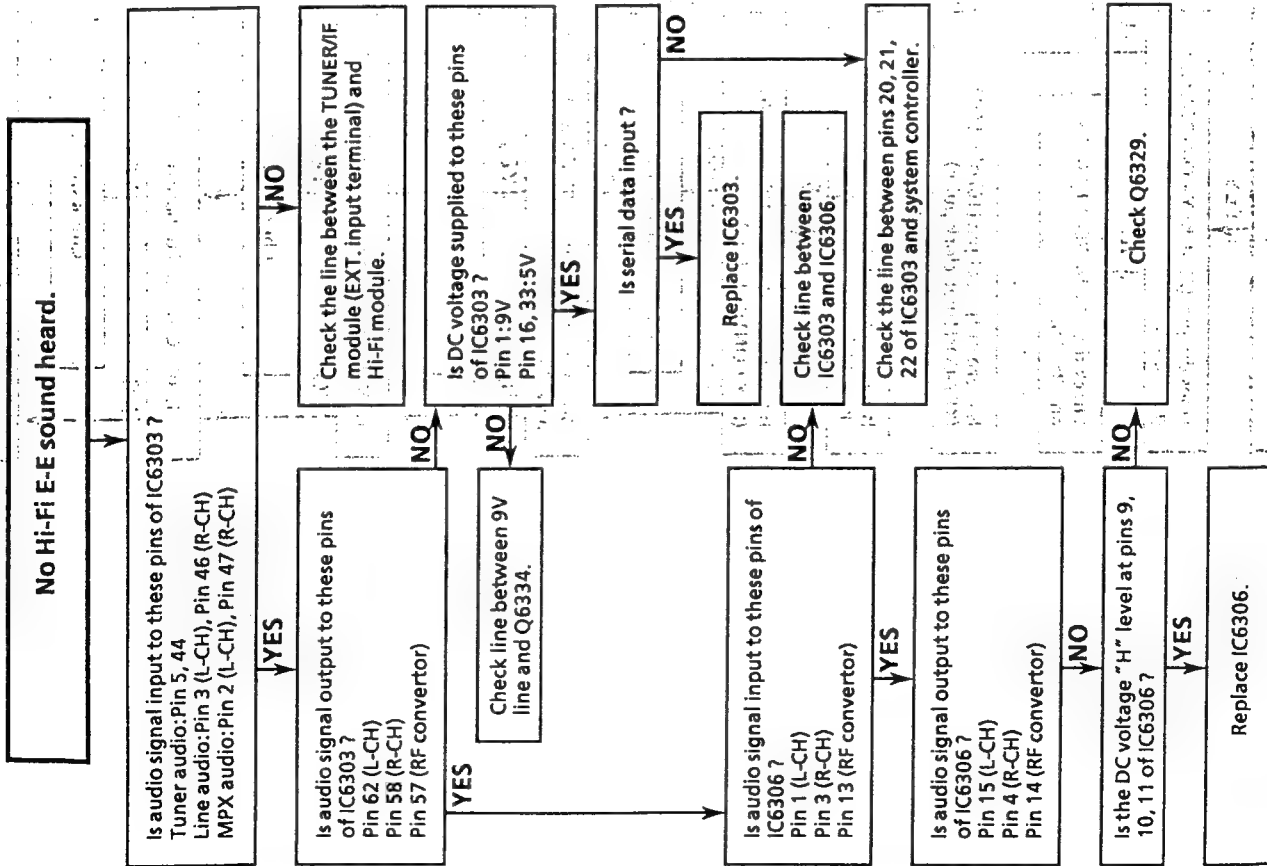
Playback is possible but in without colour.



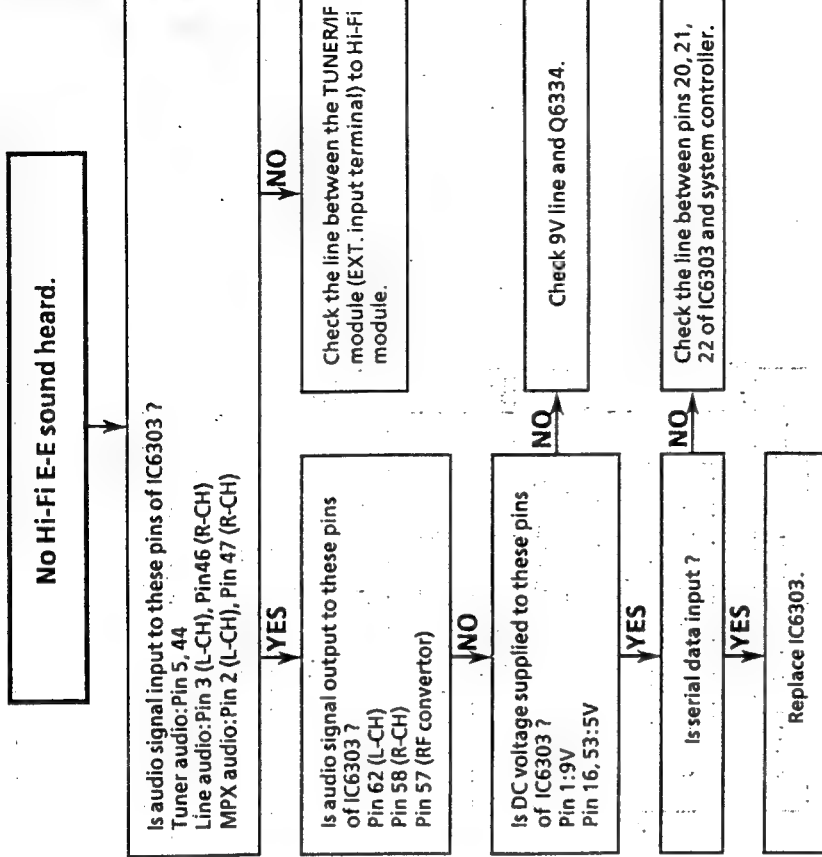
FLOW CHART NO. 22 KEY CONTROL TROUBLESHOOTING (VC-H980/H980ETS ONLY)



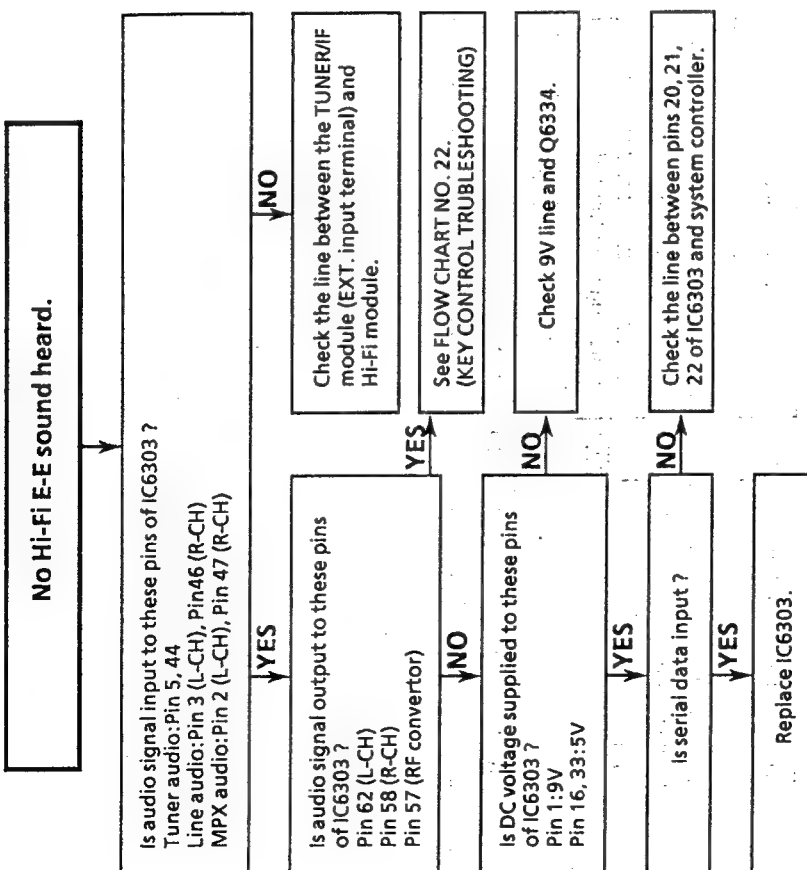
FLOW CHART NO. 23 HI-FI TROUBLESHOOTING (1) VC-H96/H96ETS ONLY



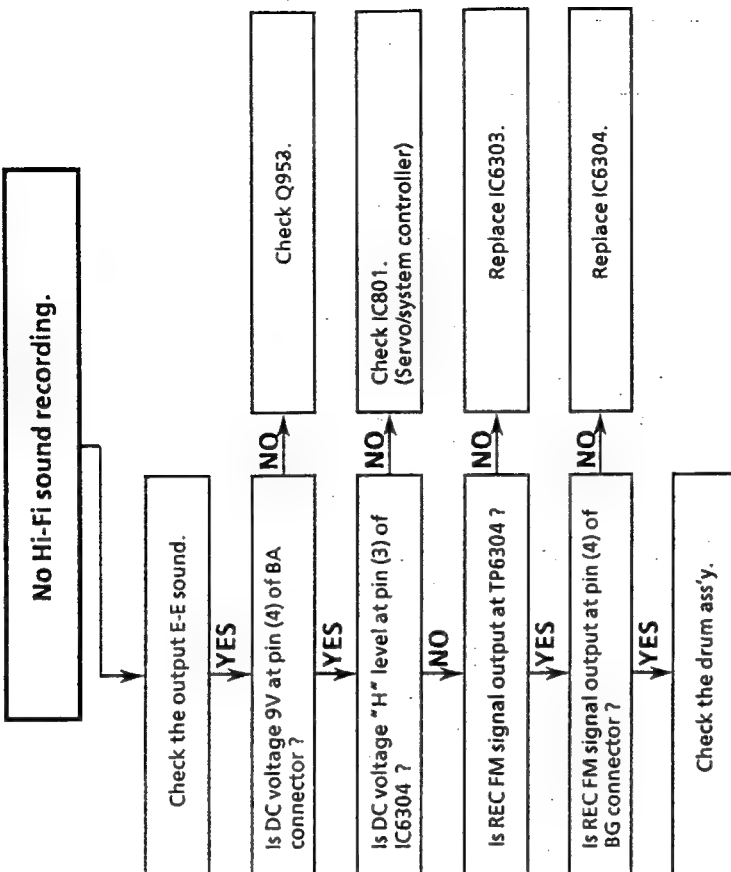
FLOW CHART NO. 23 HI-FI TROUBLESHOOTING (1) VC-H91/H91ETS ONLY



FLOW CHART NO. 23 HI-FI TROUBLESHOOTING (1) VC-H980/H980ETS ONLY

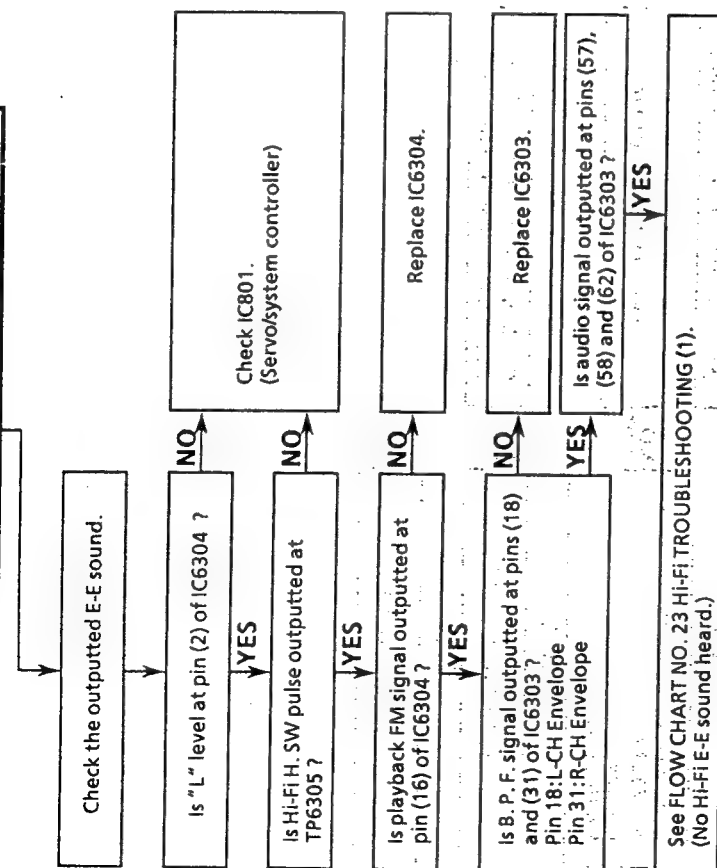


FLOW CHART NO. 24 HI-FI TROUBLESHOOTING (2)



# FLOW CHART NO. 25 Hi-Fi TROUBLESHOOTING (3)

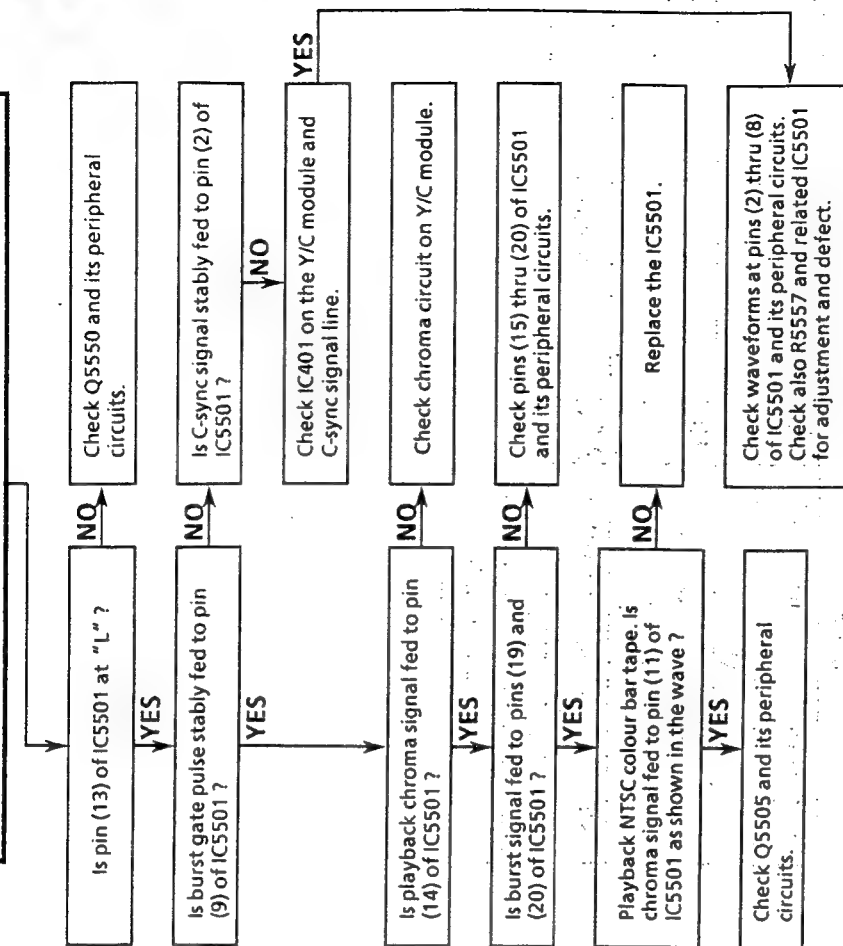
No Hi-Fi E-E sound playback.



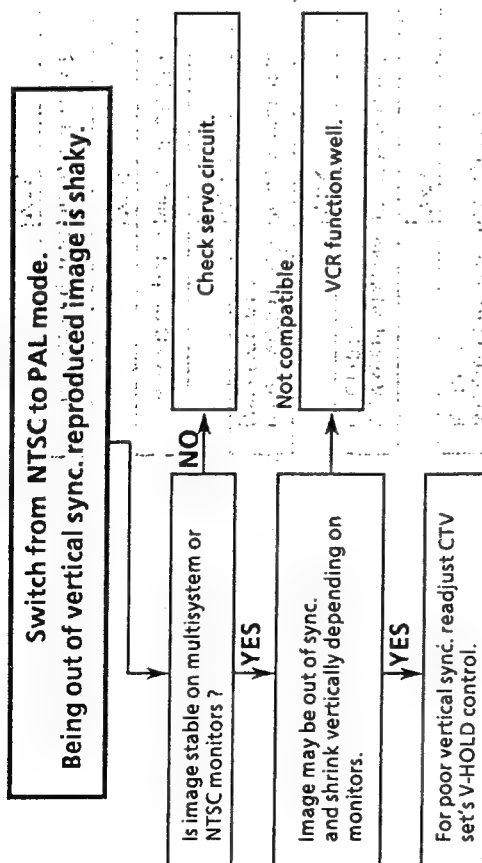
# FLOW CHART NO. 26 NTSC → PSEUDO PAL CONVERSION

## TROUBLESHOOTING (1)

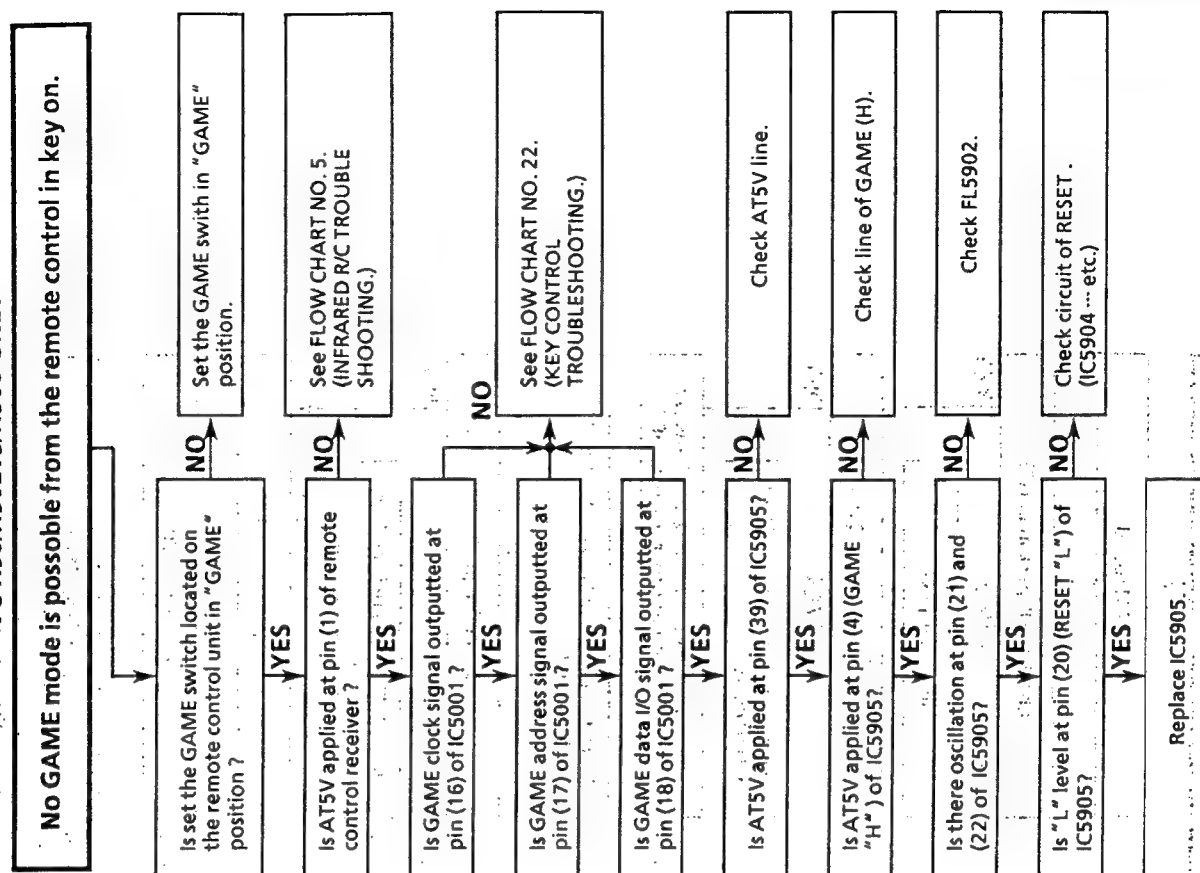
Conversion from NTSC to PSEUDO PAL mode.  
No colour appears on PAL monitor at playback.



# FLOW CHART NO. 27 NTSC → PSEUDO PAL CONVERSION TROUBLESHOOTING (2)



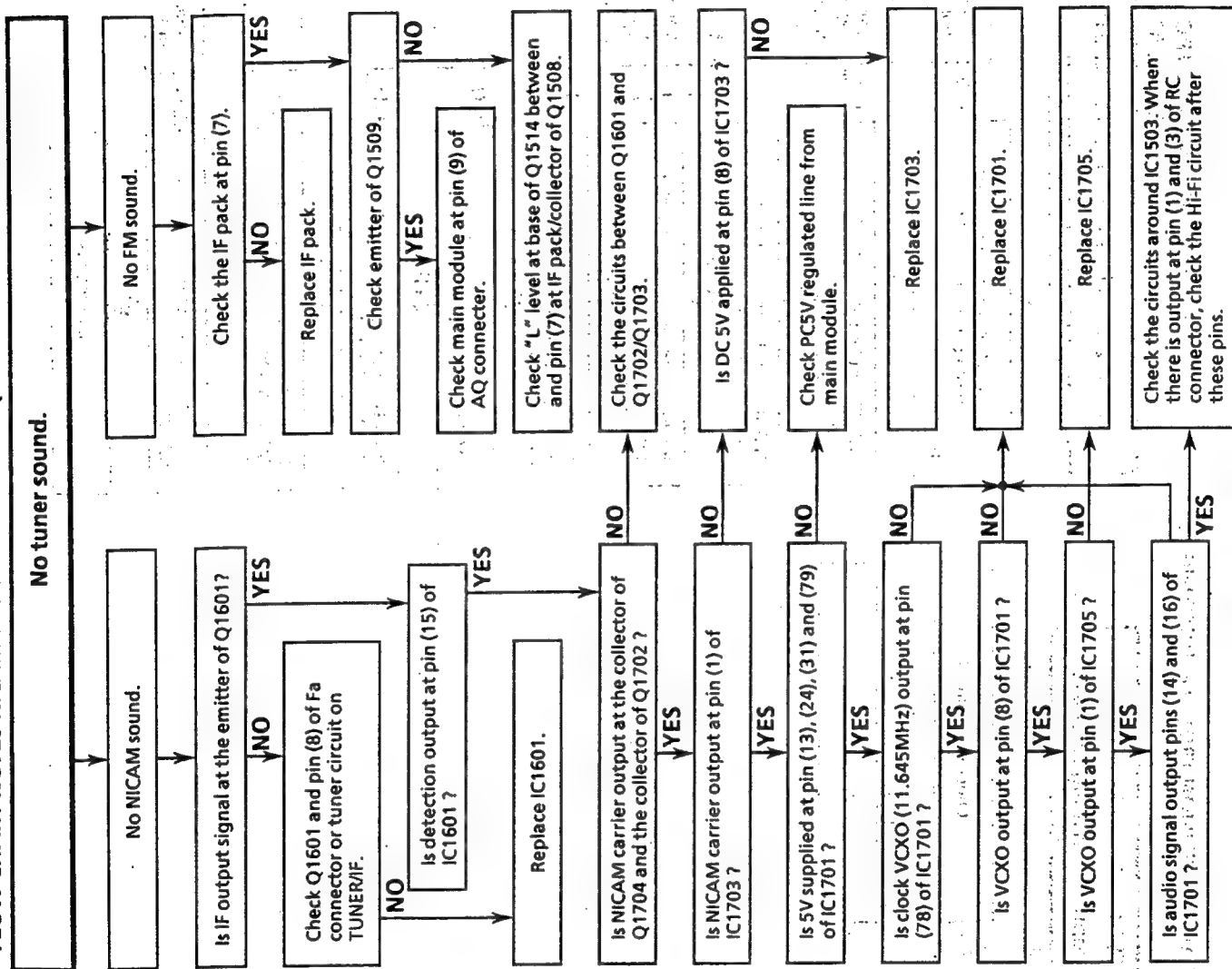
# FLOW CHART NO. 28 GAME TROUBLESHOOTING VC-H96/H96ETS/H980 ONLY



VC-H91/H91ETS  
VC-H96/H96ETS  
VC-H980/H980ETS

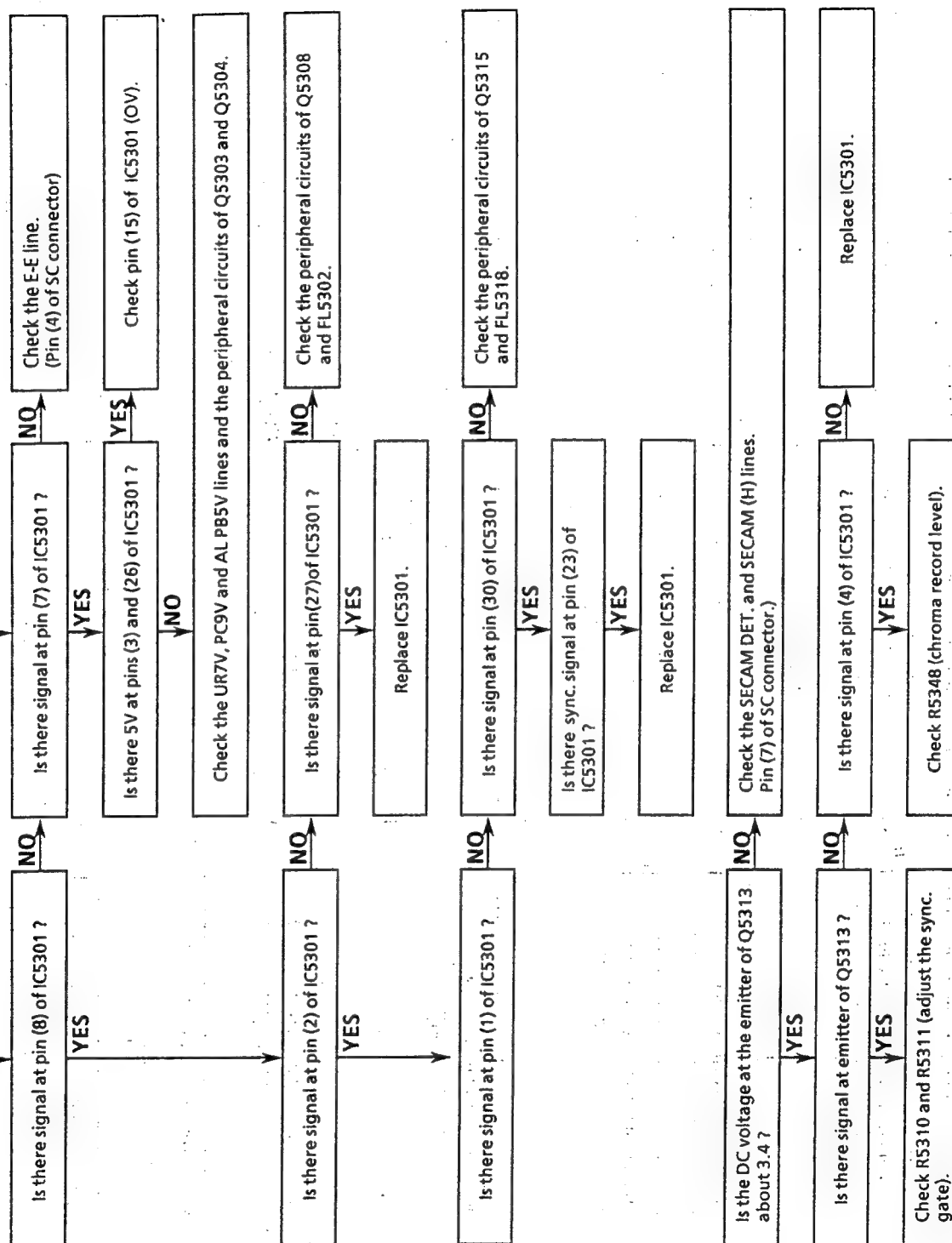


FLOW CHART NO. 29 NICAM TROUBLESHOOTING. (VC-H96/H96ETS/H980/H980ETS)



# FLOW CHART NO. 30 TROUBLESHOOTING IN RECORD MODE (SECAM CHROMA) (VC-H91/H91ETS)

Recording is black and white (colour E-E mode).





## REPLACEMENT OF TIMER IC5003 (E<sup>2</sup>PROM)

### <Servicing precautions>

When the IC5003 E<sup>2</sup>PROM (VHICA93C46-1) in the timer module has been replaced, make the following reprogramming. Depending on models, the IC5003 E<sup>2</sup>PROM has been factory-adjusted for its memory function. It is therefore necessary to reprogram the memory function for the model in question. Note that the servo circuit requires readjustments for the slow and still models.

#### •Memory function reprogramming.

1. Press the OPERATE button to turn the power on.
2. Make short-circuit between jumper pin TEST26 and TEST27 using a lead wire, on the timer module to get the unit in the TEST mode.
3. Be sure that all the fluorescent display tube light up and then remove the lead wire.
4. Press the CHANNEL SET button to get the unit in the CHANNEL SET mode.
5. Make short-circuit between jumper pin TEST26 and TEST27 again. On the module to get the unit in the reprogramming the memory function mode.
6. Using the CHANNEL (+) and (-) buttons, select the right function numbers from among I00-I19, which appear in the fluorescent display tube, referring to the E<sup>2</sup>PROM map.  
Press the DISPLAY button to pick up the functions (ON) and the CLEAR button to discard the functions (OFF). DISPLAY and CLEAR buttons, are located on the remote control unit.  
\* When the DISPLAY button has been pressed (ON), the memory function No. starts flashing.  
\* When the CLEAR button has been pressed (OFF), the memory function No. lights up.
7. Make short-circuit between jumper pin TEST26 and TEST27 to clear the TEST mode.
8. Press the CHANNEL SET button to clear the CHANNEL SET mode.
9. Make the cathode of the timer J307 and J308 on timer module short circuited, and the settings will be displayed in hexadecimal notation. Now you can see if the settings are correct.
10. Finally press the ALC button to clear the TEST mode.

Example: "ON" and "OFF" are taken as "1" and "0" respectively.

The numbers I00 to I19 are divided into five groups and each group's setting is displayed in hexadecimal notation.

I19	I18	I17	I16	I15	I14	I13	I12	I11	I10	I09	I08	I07	I06	I05	I04	I03	I02	I01	I00
0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
		↓				↓				↓				↓				↓	
		4				2				0				0				0	

"42000" appears in the fluorescent display tube.

#### •E<sup>2</sup>PROM map

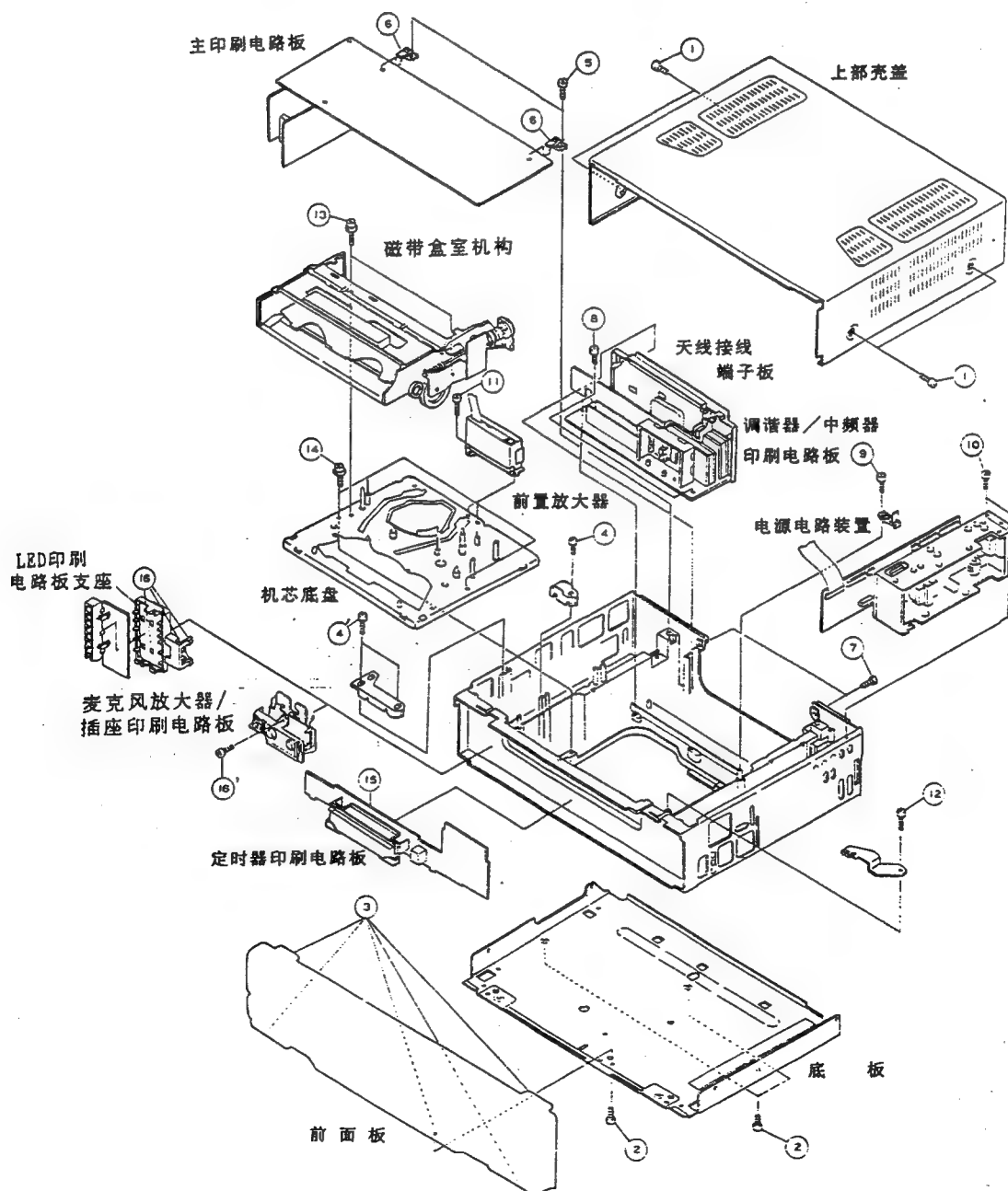
(Note: "○":ON " " :OFF)

No.	Function name					
I19	----					
I18	----					
I17	O CH					
I16	CHINESE	○			○	
I15	MPX / I <sup>2</sup> C CTL	○	○		○	○
I14	SIMUL	○	○	○	○	○
I13	SAP					
I12	----					
I11	COLOUR1					
I10	COLOUR0					
I09	KARAOKE MAKER				○	○
I08	ONE SONG PLAY				○	○
I07	APMS				○	○
I06	----					
I05	V BAND					
I04	VCP					
I03	LP/EP	○	○	○	○	○
I02	COLOUR				○	○
I01	Hi-Fi	○	○	○	○	○
I00	VCR					
Displayed No.		1C00A	0C00A	0400A	1C38E	0C38E
MODEL'S		VC-H96	VC-H96ETS	VC-H91 VC-H91ETS	VC-H980	VC-H980ETS

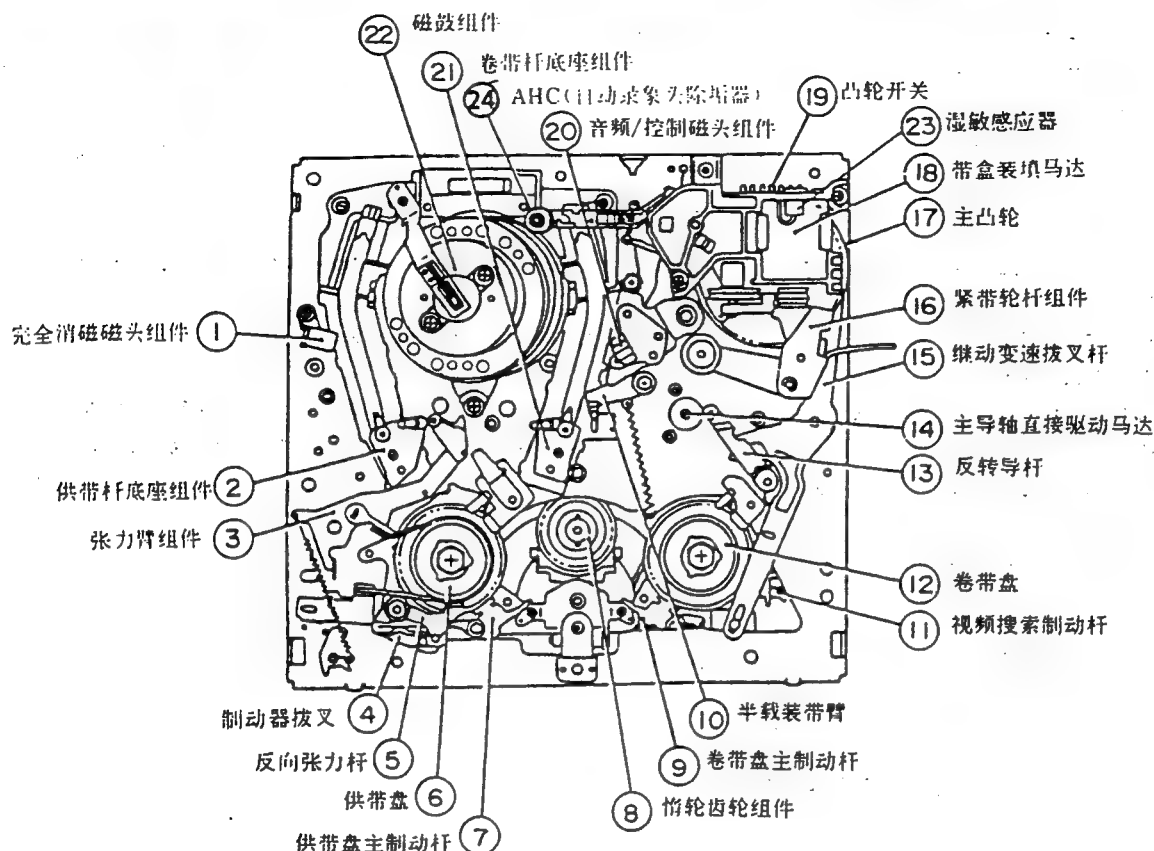
H91/H91ETS  
H96/H96ETS  
H980/H980ETS

## 分解和组装

- 上部壳盖** : 松去四支紧固螺丝①。  
将上部壳盖向后方滑动取下之。
- 底板** : 松去四支紧固螺丝②。  
将底板向后方滑动取出之。
- 前面板** : 分别松去前面板与上部壳盖和底板相连的  
5支销卡③, 取出之。
- 主印刷电路板** : 松去一支紧固螺丝④, 拆去其支座。  
(VC-H980/H980ETS除外)  
: 松去两支紧固螺丝④', 拆去其支座。  
(VC-H980/H980ETS)  
松去主印刷电路支座的两支紧固螺丝⑤和  
两支销卡⑥。  
手握主印刷电路板顶部, 向上提起取出之。
- 天线接线端子板** : 松去两支紧固螺丝⑦。
- 调谐器/中频器** : 松去两支紧固螺丝⑧。
- 印刷电路板**
- 电源电路装置** : 松去电源电路装置支座的一支紧固螺丝⑨。  
松去两支紧固螺丝⑩。
- 前置放大器** : 松去两支紧固螺丝⑪。
- 磁带盒室机构** : 松去一支紧固螺丝⑫和两支紧固螺丝⑬。
- 机芯底盘** : 松去三支紧固螺丝⑭。
- 定时器印刷电路板** : 松去两支销卡⑮。
- 电路板**
- LED印刷电路板支座** : 松去四支销卡⑯。(VC-H980/H980ETS除外)
- 麦克风放大器/插座印刷电路板** : 松去一支紧固螺丝⑯'。  
(VC-H980/H980ETS)

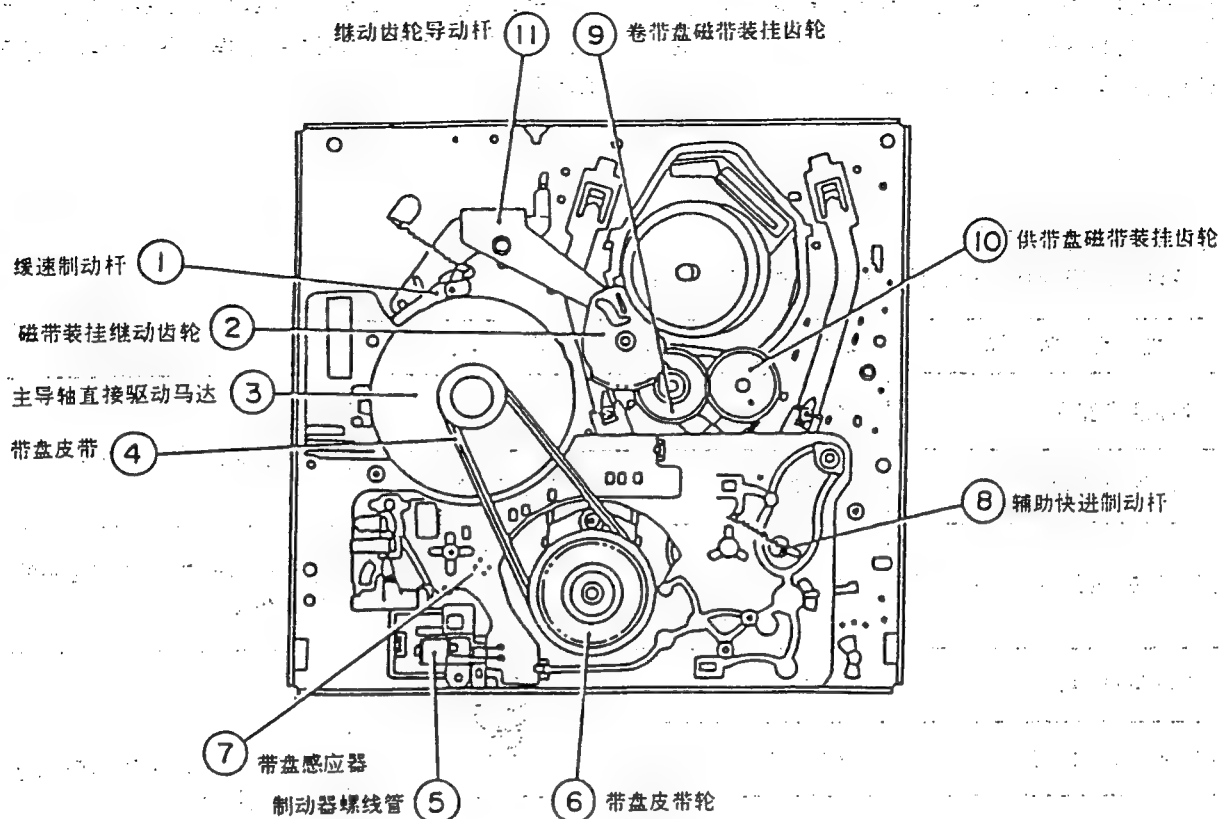


## 主要机械部件的配置(俯视)及其功能



序号	功 能	序号	功 能
1.	完全消磁磁头组件 于录象工作状态时消去录象磁带的全部记录内容。	13.	反转导杆 于视频搜索倒带状态时, 拉挂磁带, 并且通过其高导杆和低导杆控制其走带高度。
3.	张力臂组件 检测走带时录象磁带的松紧程度, 并与张力带一道对供带盘产生制动作用。	15.	继动变速拨叉杆 将主凸轮的的运动传输至制动器拨叉, 以及转为反转导杆的动作。
4.	制动器拨叉 设定制动器制动位置, 或诸如停止以及再生状态时制动器应处位置。	16.	紧带轮杆组件 于走带状态中, 压紧磁带于主导轴。于磁带出盒动作时, 其右侧突出部拨动磁带盒室控制组作离合器, 使其机构将带盒推出盒室。
5.	反向张力杆 于磁带装填动作以及从再现转向视频搜索倒带动作中, 以适当的程度对供带盘产生制动作用, 以避免磁带的松弛。	17.	主凸轮 装挂磁带时, 顺时针转动, 退挂磁带时, 逆时针转动, 并于各种相应的工作状态, 对制动器拨叉产生作用。
7.	供带盘主制动 于录象机动作停止时以及录象机处快进或倒带状态时, 对供带盘产生制动作用, 以防止磁带的松弛。	18.	带盒装填马达 其马达之作用在于为填装机构提供带盒填入及磁带装挂的动力。其动力通过马达皮带的传动, 转为主凸轮及磁带盒室控制机构的动作。
9.	卷带盘主制动 于录象机动作停止时以及录象机处快进或倒带状态时, 对卷带盘产生制动作用, 以防止磁带的松弛。	19.	凸轮开关 与主凸轮同步转动, 通过其内部开关, 对各工作状态时主凸轮的位置进行检测控制。
10.	半载装带臂 于快进或倒带状态时, 挂磁带与音频/控制(A/C)磁头相触, 使之处于半载装带状态。	23.	湿敏感应器 对录象机内潮湿程度进行感应监测。一旦录象机内潮湿程度超出其规定值, 其感应器便停止录象机的所有机械动作。
11.	视频搜索制动杆 其制动杆一般总与卷带盘相触, 以适当的程度对卷带盘产生制动作用。于视频搜索状态时, 其制动杆对卷带盘施加的制动力比一般状态时更大一些。		

## 主要机械部件的配置(仰视)及其功能



序号	功 能	序号	功 能
1.	缓速制动器 于缓速静止状态时,其制动器相触于主凸轮连动的主导轴,对其轴产生适当的制动作用。	7.	带盘感应器 产生一光束射于带盘底侧的反射板上,并通过接受其反射光对带盘的转动情况进行监测。
3.	主导轴直接驱动马达 提供走带所需动力。其动力的转换由带盘皮带实现。	8.	辅助快进制动杆 于快进或倒带状态,对供带盘产生一定程度的制动作用。
4.	带盘皮带 带动带盘皮带轮转动,以驱动磁带的运转。	9.	卷带盘磁带装挂齿轮 通过磁带装挂继动齿轮,移动卷带杆底座及导辊,并将磁带环绕于磁鼓。另外,其齿轮还有传动力于供带盘磁带装挂齿轮之作用。
5.	制动器螺线管 于快进或倒带状态时,吸引抓握制动器拨叉;于停止状态时,松开其拨叉。	10.	供带盘磁带装挂齿轮 通过卷带盘磁带装挂齿轮传来的动力,移动供带杆底座及导辊,并将磁带环绕于磁鼓。
6.	带盘皮带轮 将主导轴直接驱动马达的动力经带盘惰轮传送给带盘。	11.	继动齿轮导杆 通过磁带装挂继动齿轮,传主凸轮之运动于卷带盘磁带装挂齿轮。



## 机械部件的调整、更换及装配


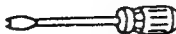


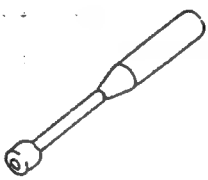


这里我们将为您介绍一些较简单的保养调试方法。这些方法与需要特殊的仪器和工具的复杂检修(例如,磁鼓的组装或更换等)相比更为容易简单。

我们相信,下表所列便于使用的工具在您为本录象机作定期保养以维持其原有的工作状态中无疑能起很大的作用。

### 机械部件调整必需的工具

检查修理时,应准备下列工具才能顺利进行修理工作。

序号	工具名称	零件编号	编码	形 状	备 注
1	带盘高度调整工具	JiGRH0002	BR		用于检查、调整带盘高度。
2	主平面调整工具	JiGMP0001	BY		
3	音频/控制磁头倾斜调整工具	JiGACH-F18	BU		用于设定音频 / 控制磁头的倾斜角度。
4	转矩测量计(90克)	JiGTG0090	CM		用于检查、调整供带轮和卷带轮的转动力矩。
	转矩测量计(1.2公斤)	JiGTG1200	CN		
5	转矩测量计测头	JiGTH0006	AW		
6	盒匣磁带式转矩测量计	JiGVHT-063	CZ		用于检查、调整卷带轮的转动力矩以及测量磁带反向张力。
7	张力测量计(300克)	JiGSG0300	BF		分为300克和2.0公斤两量级,用于张力测量。
	张力测量计(2.0公斤)	JiGSG2000	BS		
8	六角扳手(0.9毫米)	JiGHW0009	AE		用于松弛或紧固特制六角螺栓。
	六角扳手(1.2毫米)	JiGHW0012	AE		
	六角扳手(1.5毫米)	JiGHW0015	AE		
9	校正用磁带 (PAL制式)	VROCP5V	CK		专用于机器的电路微调。
	Hi-Fi校正用磁带 (PAL制式)	VROCBFFS	CB		
	校正用磁带 (NTSC制式)	VROATSV	CK		
	校正用磁带 (NTSC制式)	VRONBZZS			
	校正用磁带 (NTSC制式)	VR9EBZCS	BP		
10	磁鼓更换工具	JiGDT-0001	BG		用于更换装置的上部磁鼓。

序号	工 具 名 称	零件编号	编号	形 状	备 注
11	张力测量计接续器	JiGADP003	BK		用于张力测量计。
12	专用螺丝刀	JiGDRIVERH-4	AP		用于导辊高度调整。
13	张力带及张力板调整工具	JiGDRIVER-6	BM		用于张力带和张力板的调整。
14	扭转改锥 (5 公斤)	JiGTD1200	CB		用于扭转树脂制工具。标准扭转值为 5 公斤。
15	套管改锥	JiGDRIVER110-7	AS		用于音频/控制磁头高度和 X 位置的调整。
		JiGDRIVER110-4	AV		用于定位导杆的高度调整。
16	定位导杆高度调整工具	JiGGH-F18	BU		用于定位导杆的高度调整。
17	反转导杆高度调整工具	JiGRVGH-F18	BU		用于反转导杆的高度调整。

## 机械部件的定期保养期间

为保持机械部件的正常工作性能，务必按下表定期进行维护保养。

部件名称	保养间隔	每500 小时	每1000 小时	每1500 小时	每2000 小时	可能出现症状	备 注
导辊组件		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>	水平噪音线出现，磁头不时被磁带缠绞。	如发生不正常的旋转或显著的摇摆，就需更换该部件。
供带阻抗滚子		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>		用高级异丙醇擦拭。
供带阻抗滚子(内侧)			<input type="checkbox"/>		<input type="checkbox"/>		
供带阻抗滚法兰		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		用指定清洁剂擦拭与磁带接触部份。
定位导杆		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
斜杆		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>		
视频磁头(上部磁鼓组件)		<input type="checkbox"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="radio"/>	信号/噪声比过小,无彩色表现。	用指定清洁剂擦拭与磁带接触部份。
完全消磁磁头		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>	色彩过淡，图象闪跳。	
音频/控制磁头		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>	声音太小或者噪音太大。	
下部磁鼓组件		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>	装入校正用磁带时，包络线非平坦。	
主导轴直接驱动马达		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>	磁带不转，色彩不均。	
紧带轮		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>	不走带，磁带松弛。	
带盘皮带			<input type="checkbox"/>		<input type="radio"/>	不走带，磁带松弛，快进或倒带时走带不正常。	
装填皮带			<input type="checkbox"/>		<input type="radio"/>	带盒不填入或不退出。	
带盒装填皮带			<input type="checkbox"/>		<input type="radio"/>		
张力带组件					<input type="radio"/>	图象水平扫描线摆动不稳。	
装填马达					<input type="radio"/>	带盒不填入或不退出。	
AHC (自动录象头除垢器)			<input type="radio"/>		<input type="radio"/>		除垢器滚轮部位的磨损过大时，就需更换该部件。更换时，只需更换录象头除垢器滚轮组件即可。
带盘座*						见下图说明。	
* 带盘座部件的保养请参见下表。							
供带/卷带盘			<input type="checkbox"/> △		△○	不走带，磁带松弛。	用高级异丙醇擦拭。
视频搜索制动杆					<input type="radio"/>		
惰轮齿轮组件					<input type="radio"/>	不走带。	
带盘皮带轮			<input type="checkbox"/> △		<input type="checkbox"/> ○		
供带/卷带主制动杆					<input type="radio"/>	磁带松弛。	

注意：○：部件更换

□：部件清洗(用不起毛的绸布蘸异丙醇擦拭)

△：部件注油(注有标记之部件应该每1000小时用高级轴油点注润滑)

如发现所测数值超过或不及规定范围，务必对该部件进行清洗或加以更换。

## 磁带盒室控制机构的拆卸及安装

### ● 盒室控制机构的拆卸

1. 退出磁带盒匣，设机构于出盒状态。
2. 从电源插座中拔出电源引线插头。
3. 按下述步骤的要求顺序进行拆卸。
  - a) 松卸带盒装填皮带①。
  - b) 拆去全平电缆(FFC)②。
  - c) 松去紧固磁带盒室控制机构的两支紧固螺丝③。
  - d) 按箭头④方向移动磁带盒室控制机构，然后将其向上拉出。

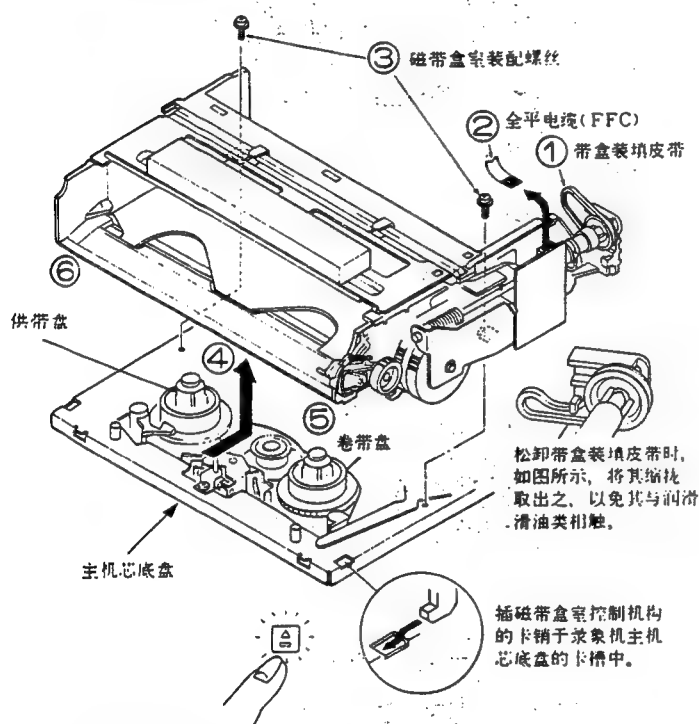


图1-1

### ● 盒室控制机构的组装

1. 在组装磁带盒室控制机构之前，先保持录像机于电源开启状态，按停止键置录像机于停止状态。然后，从电源插座中拔去电源引线插头。(录像机处于出盒状态)。
2. 按拆卸步骤的相反顺序进行组装。

#### 注意：

1. 在拆卸或组装磁带盒室控制机构之前，先确认将电源引线插头拔出电源插座。
2. 拆卸或组装带盒装填皮带时，注意不要让其与润滑油相触。如装填皮带上沾有油渍，务请立即清洗之。
3. 拆卸或组装时，如使用带磁螺丝刀，务请注意不要让其触碰音频/控制(A/C)磁头，完全消磁(FE)磁头以及磁鼓。
4. 拆卸或组装磁带盒室控制机构时，务请谨慎小心，切勿磕碰其机构，同时注意不要让工具等碰撞导向销、磁鼓等精密度较高的部件。

5. 拆卸或组装磁带盒室控制机构时，均务请先将录像机置于出盒状态。

6. 组装之后，填装一录像带盒于盒室控制机构之中。(如果其盒室控制机构动作正常，将磁带取出之后，直接对机构相位和盒室控制器进行精调)。

无带盒填入状态下盒室控制机构的机械动作检查于电源开启状态时，无带盒填入状态也能对盒室控制机构的机械动作进行检查。其要点如下：

1. 用手旋转卷带盘⑤(正向和反向两方向)，检查视频搜索倒带以及倒带的动作情况。如果卷带盘不转，带盘感应器动作，以使控制机构移至出盒状态。
2. 触按停止(STOP)键后，机构不在其正常停止位置处停止。控制机构便转至出盒状态，然后停止。
3. 于再现、视频搜索倒带以及视频搜索快进状态时，触按停止(STOP)键后，供带盘⑥仍继续旋转数秒钟，以减少控制机构移转为出盒状态过程中磁带的松弛量。在这种情况下，用手停住供带盘⑥，同时适当旋转卷带盘⑤，这样能缩短其动作时间。

### 蜗轮机构的更换

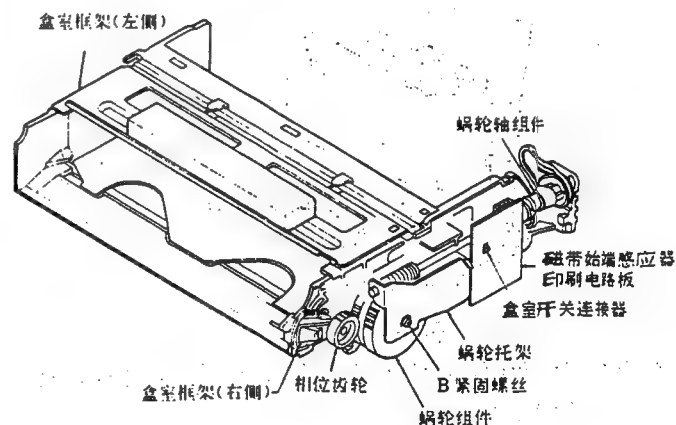


图1-2

### ● 蜗轮机构的拆卸

- 
- Diagram illustrating the assembly of the magnetic head sensor PCB. The components shown are:
- 磁带始端感应器印刷电路板 (Magnetic Head Sensor PCB)
  - 磁带始端感应器印刷电路板固定卡扣 (Magnetic Head Sensor PCB Fastener)
  - 盒盖开关连接器 (Box Cover Switch Connector)
  - 焊接 (Soldering)

图 1-3

- 

图 1-4

- 

图1-5

- 
- 蜗轮轴组件
- 带盒装填皮带
- 皮带轮
- 盒室框架 (右侧)
- 蜗轮组件
- 相位齿轮

图 1-6

- 
- 滑填板卡销
- 转轱杆
- 相位齿轮轴
- 蜗轮组件
- 校位标记
- 校位标记
- 相位齿轮
- 开口垫圈
- 图1-7

图 1-7



图 1-8

### ●蜗轮机构的组装

- 注：此时，务请确认滑填板卡销应正好嵌于导动齿轮臂的卡槽中。



## 带盒装填皮带的更换

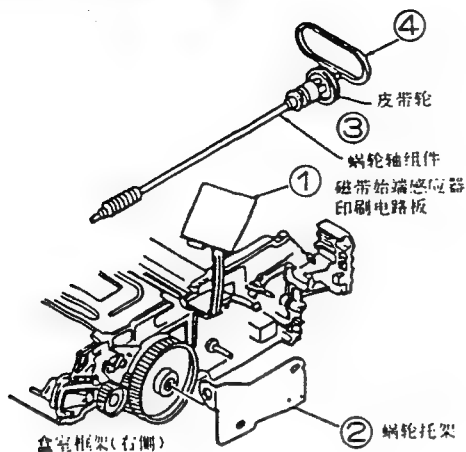


图1-13

1. 卸去定位于盒室框架(右侧)的磁带始端感应器印刷电路板①以及蜗轮托架②。
2. 卸去蜗轮轴组件③。
3. 更换一新的带盒装填皮带④。

### 注意：

1. 切勿过力拧紧蜗轮托架板上的B紧固螺丝。其规定紧固力矩为 $5.0 \pm 0.5 \text{ kg} \cdot \text{cm}$ 。
2. 更换完毕，检查皮带上是否沾有润滑油。如沾有之，则须用规定清洗剂清洗其油渍。
3. 检查离合器转辙杆是否就位于其规定位置，其机械动作是否正常。

## 离合器转辙杆的检查

### ●转辙杆的检查

将盒室机构从主机芯底盘拆离或更新安置于主机芯底盘时，均须先置其于出盒状态。

检查盒室机构中诸如离合器转辙杆类的每个部件均就位于其规定之处，否则，便很可能引起机械误动作的产生。

### 注意：

盒室机构各部件之规定位置如图1-14所示。

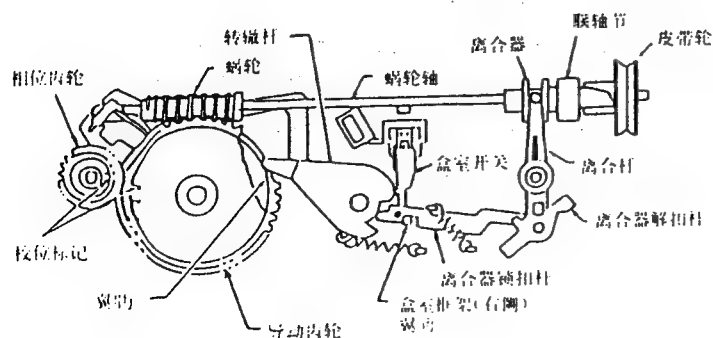


图1-14

1. 首先，先检查离合器转辙杆的梢端是否卡扣于导动齿轮(右侧)的翼肋。
2. 然后检查盒室框架(右侧)的翼肋是否卡嵌于离合器锁扣杆的凹槽中。
3. 最后，检查离合杆与离合器的位置关系以及离合器与皮带轮的位置关系均是否符合图1-15所示的规定要求。

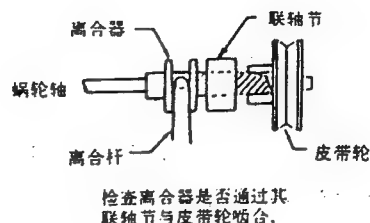


图1-15

### ●转辙杆的重新设置

离合器、或离合器转辙杆和离合器锁扣杆处未锁扣状态时，请按下述步骤重新设置之。

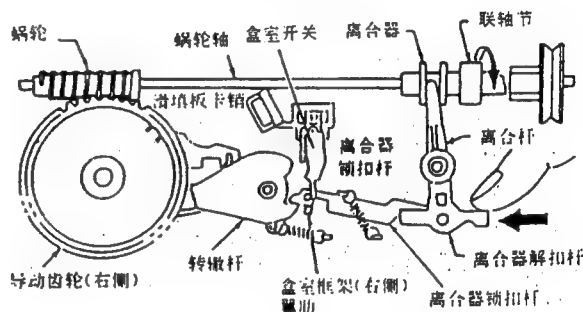


图1-16

1. 按图1-16中旋转箭头所示方向(顺时针)旋转联轴节，移动带盒滑填板，直至滑填板卡销移至滑填板凹槽底部为止(带盒填装状态)。

注：带盒滑填板装有一锁扣装置。移动此滑填板时，应先解除位于盒室框架(左侧和右侧)之上的锁扣。

2. 滑填板移至图1-16所示位置后，用手指沿图中直线箭头所示方向按压离合器解扣杆，让离合器锁扣杆紧扣盒室框架(右侧)的翼肋。

3. 然后，再逆时针方向旋转联轴节，让带盒滑填板上升至带盒插入口平面，同时往复式弹簧处于张拉状态为宜。

注：滑填板移至带盒插入口平面时，设有锁扣该滑填板之必要。

## 解扣杆的拆卸和组装

### ●解扣杆的拆卸

1. 将滑填板降至带盒填入就位状态之位置。(顺时针旋转蜗轮轴上的联轴节, 让滑填板下移)。

注: 移动滑填板前, 先解除其锁扣。

2. 用手稍微撑开盒室框架两侧(左侧和右侧), 让滑填板两侧夹持器(左侧和右侧)的销笋脱离盒室框架两侧的榫孔。

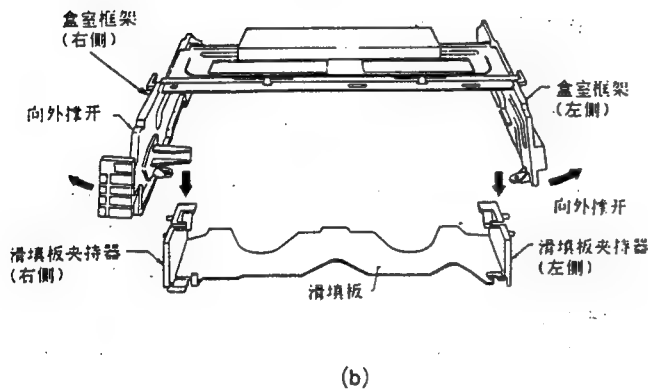
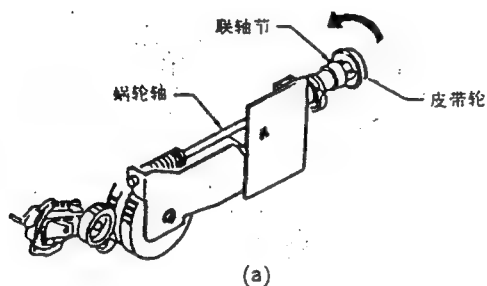


图1-17

3. 上提滑填板夹持器(右侧)2毫米左右, 用一尖头螺丝刀顶压夹持器上两支锁键, 让滑填板脱离夹持器。这时, 务请注意不要损伤其锁键。

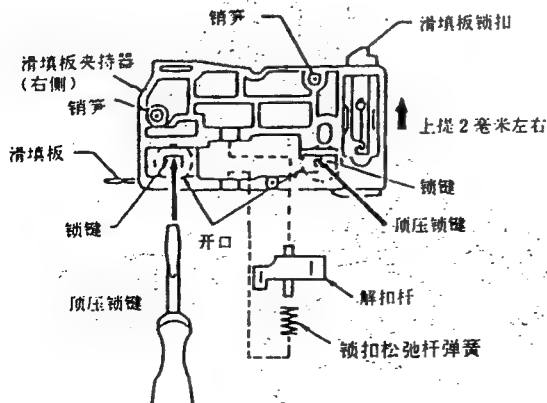


图1-18

4. 从滑填板夹持器(右侧)上取下解扣杆。

### ●解扣杆的组装

1. 按拆卸解扣杆步骤的相反顺序进行组装。(见图1-17和图1-18)。
2. 将解扣杆就位于滑填板夹持器(右侧)。
3. 下移滑填板, 以使滑填板夹持器(右侧)上的两支锁键与滑填板上的两个开口对齐。
4. 用手稍微撑开盒室框架两侧, 将滑填板两侧夹持器(右侧和左侧)的销笋分别扣入盒室框架(右侧和左侧)的榫孔中。

注: 检查滑填板两侧夹持器(右侧和左侧)的销笋是否分别正确地扣入盒室框架两侧(右侧和左侧)的榫孔中; 导动齿轮臂是否充分地与滑填板夹持器啮合。

5. 逆时针方向旋转联轴节, 让带盒滑填板升至带盒插入口平面。

## 无盒室控制机构的走带测试

1. 插电源引线插头于电源插座。
2. 开启电源开关。
3. 用手打开磁带盒匣端口之盖①。
4. 用胶带②张贴之以保持其开盖状态。
5. 置其于主机芯中的走带机构。
6. 压一重物④于磁带之上, 以防盒匣的翘起。
7. 作胶带的走带测试。

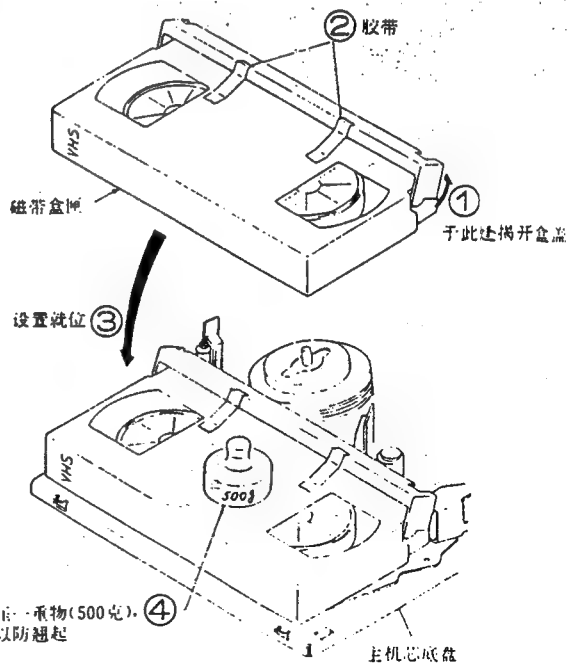


图1-19

注: 压其重物不得超过500克。



## 带盘座的拆装与高度调整

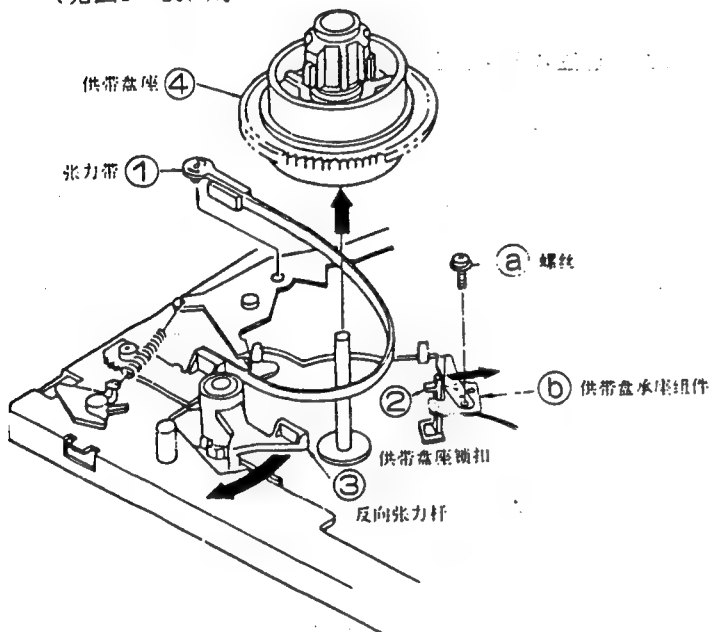
1. 拆去磁带盒室控制机构。
2. 设录象机于无带盒填入的再生状态。拔去电源引线插头。
3. 置惰轮齿轮于其中心位置(空档位置)。

### ● 供带盘座的拆卸

1. 拆下张力带①。(注意：切勿让其弯折扭曲)。
2. 松去螺丝③，拆去供带盘座组件⑥。
3. 松去供带盘锁扣②以及反向张力杆③。
4. 向上直拉供带盘座④，取出之。

### 注意：

1. 切勿弯折扭曲张力带。
2. 检查调整张力杆位置(见第97页有关项目所述)。
3. 切勿损坏磕伤供带盘座上的齿轮和惰轮齿轮。
4. 拆卸时，应按图中箭头所示方向按压张力带。(见图1-20(b))。



### 注意：

拆卸时，应按图中箭头所示方面按压张力带，以免锁扣变形。

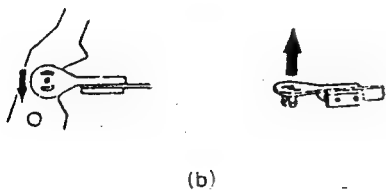


图1-20

### ● 卷带盘座的拆卸

1. 松去螺丝③，拆去卷带盘座。
2. 松去卷带盘座锁扣①。
3. 向上直拉卷带盘座②，取出之。

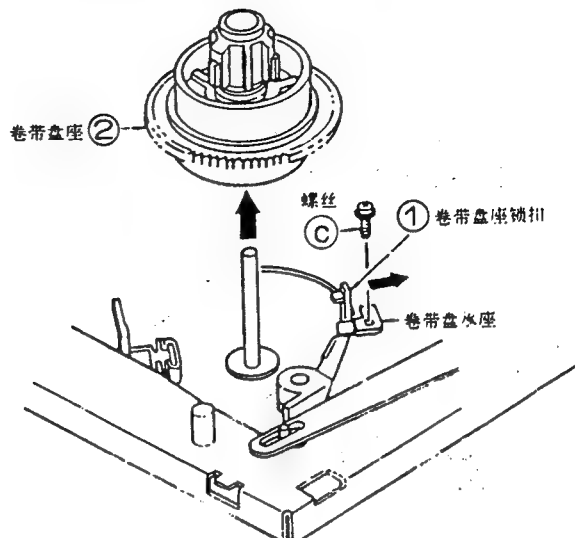


图1-21

### ● 供带盘座的更换

1. 清擦供带盘座轴①，并注油加以润滑。
2. 松去供带盘座锁扣②以及反向张力杆③。
3. 将准备好的新供带盘座④插套入其轴。
4. 环张力带⑤于供带盘座装置安置就位，并将其端插入张力臂之插孔。
5. 安置供带盘座组件⑥就位，旋紧其紧固螺丝③。

### 注意：

1. 安置供带盘座时，务请格外小心，切勿弯折扭曲张力带。
2. 使用工具时，切勿磕碰损伤供带盘齿轮，反向张力杆，供带盘座锁扣以及其它部件。

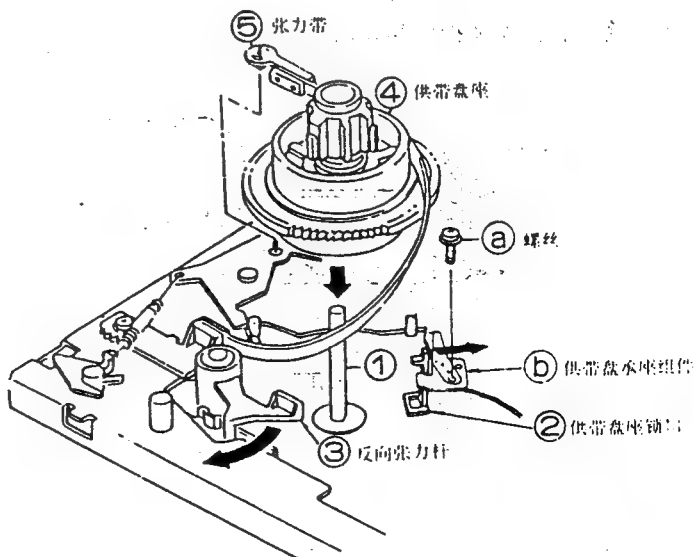


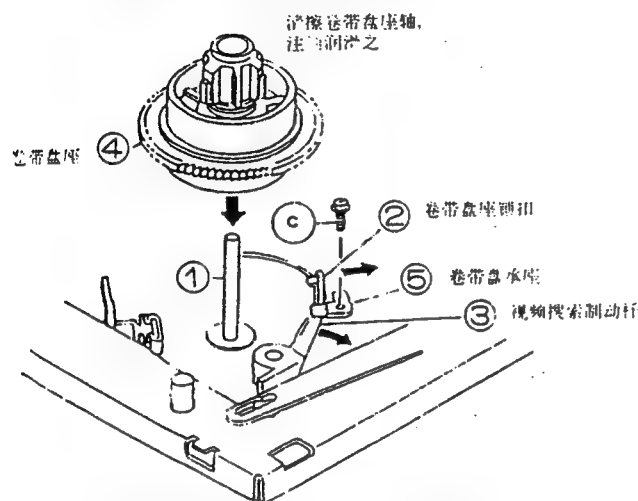
图1-22

### ●卷带盘座的更换

1. 清擦卷带盘座轴①，并注油加以润滑。
2. 松去卷带盘座锁扣②以及视频搜索制动杆③。
3. 将准备好的新卷带盘座④插入其轴。
4. 安置卷带盘座⑤就位，旋紧其紧固螺丝⑥。

注意：

务请小心谨慎，切勿碰伤视频搜索制动杆。



用一尖头螺丝刀按图中所示箭头方向松开卷带盘座锁扣及视频搜索制动杆，使卷带盘座更容易安置。

图1-23

\* 带盘座更换之后，须检查调试视频搜索倒带时的反向张力(见第96页)，以及其制动力矩(见第98页)。

### ●带盘高度的检测和调整

注意：

将主平面板设置于主机芯，注意切勿磕碰磁鼓(见图1-24所示)。

1. 用手指压住带盘座，同时用一螺丝刀左右转动其带盘(见图1-26(a)所示)，以对其高度进行调整。

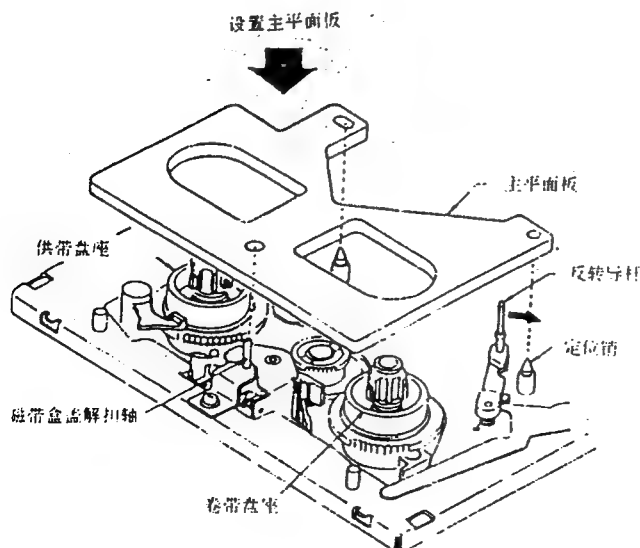


图1-24

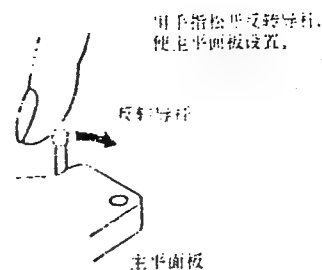
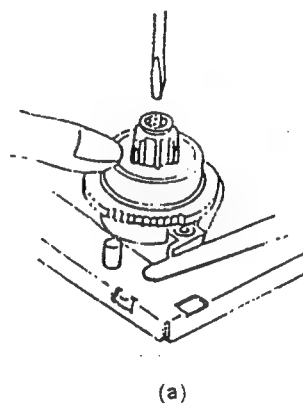


图1-25

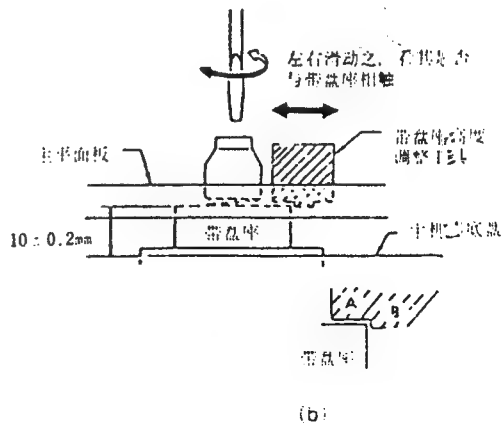
2. 检查带盘座是否低于图示A所示位置而高于B所示位置。如果所测高度不在A B两位置间的要求范围内，则须通过旋转高度调整螺丝对其高度进行调整。(见图1-26(b)所示)。

注意：

带盘座只要一经更换，就必须对其进行高度的检测和调整。



(a)



(b)

图1-26

### 快进状态时卷带转矩的检测和调整

- 拆去磁带盒室控制机构
- 转矩测量计的设置

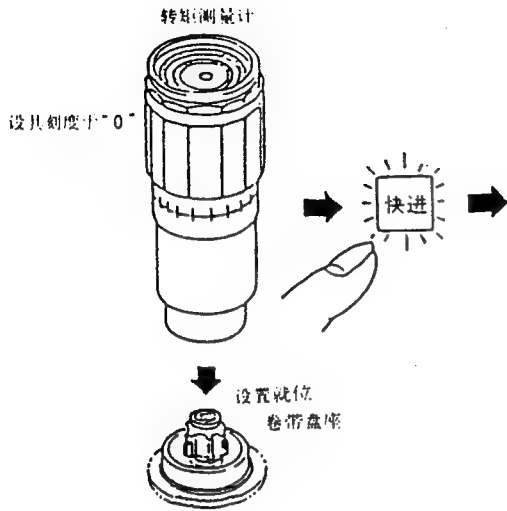


图1-27

#### ● 快进转矩的检测

用手缓慢地沿卷带方向旋转转矩测量计(2~3秒/转)。

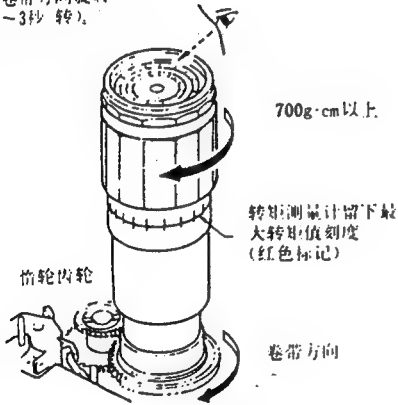


图1-28

#### ● 快进转矩的调整

1. 如果所测快进卷带转矩超出或不及规定值范围，则需用清洗液清擦主导轴直接驱动马达皮带轮，带盘皮带及其皮带轮。然后，再测量之。
2. 如果清擦后所测快进卷带转矩仍不符规格要求，则需更换带盘皮带。

#### 注意：

1. 设置及计测时，须用手向下按住转矩测量计，以免卷带盘的旋转甩飞安置于其上的转矩测量计。
2. 作卷带转矩检测时，不宜让带盘座锁扣时间过长。

### 倒带状态时卷带转矩的检测和调整

- 拆去磁带盒室控制机构
- 转矩测量计的设置

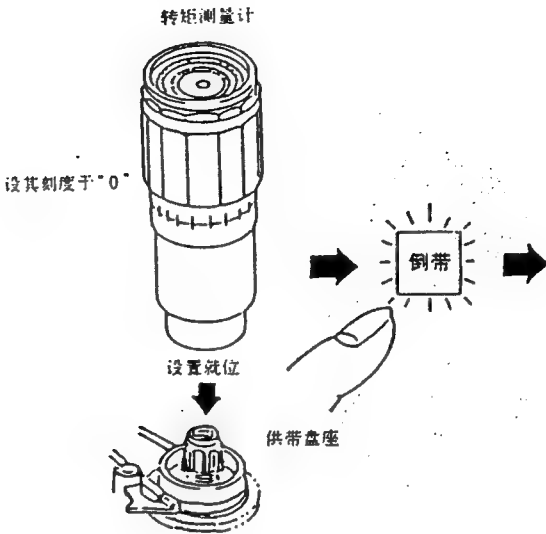


图1-29

#### ● 倒带转矩的检测

用手缓慢地沿供带方向旋转转矩测量计(2~3秒/转)。

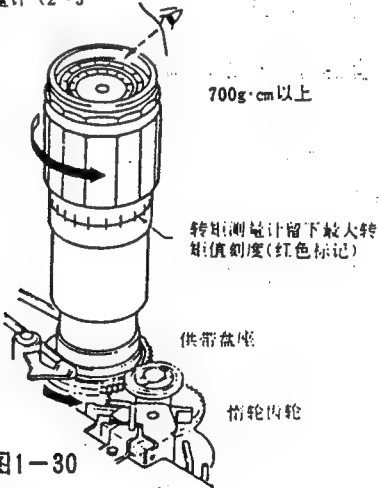


图1-30

#### ● 倒带转矩的调整

1. 如果所测倒带转矩超出或不及其规定值范围，则需用清洗液清擦主导轴直接驱动马达皮带轮，带盘皮带及其皮带轮。然后，再测量之。
2. 如果清擦后所测倒带转矩仍不符合规格要求，则需更换带盘皮带。

#### 注意：

1. 设置及计测时，须用手向下按住转矩测量计，以免卷带盘的旋转甩飞安置于其上的转矩测量计。
2. 作卷带转矩检测时，不宜让带盘座锁扣时间过长。

## 再现状态时卷带转矩的检测和调整

1. 拆去磁带盒室控制机构。
2. 用手揭开盒匣磁带式转矩测量计端口盒盖，用胶带张贴之以保持其开盖状态。

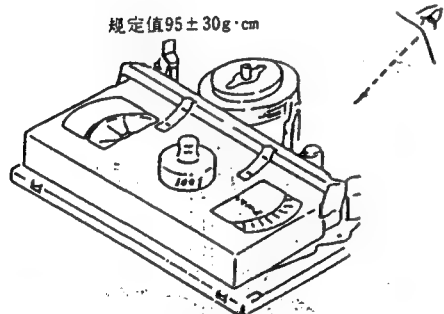
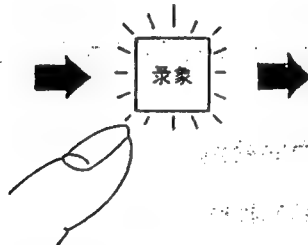
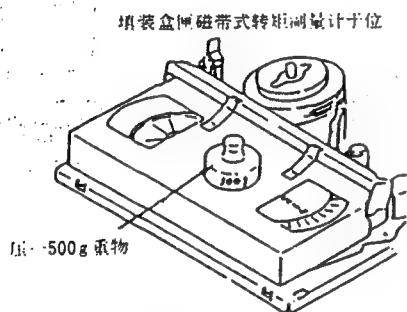
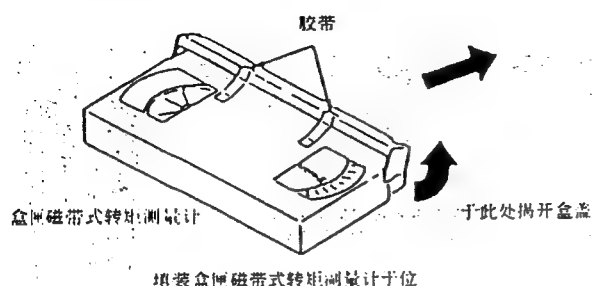


图1-31

### ● 再现卷带转矩的检测

1. 检查所测值是否于  $95 \pm 30 \text{ g} \cdot \text{cm}$  的规定范围内。
2. 由于带盘旋转的不均匀性，所测转矩值有可能产生波动现象。这时应取波动值的中心值为其测定值。
3. 触按录象键(REC)，置录象机为录象状态，检查这时的卷带转矩是否也满足上述要求。

### ● 再现卷带转矩的调整

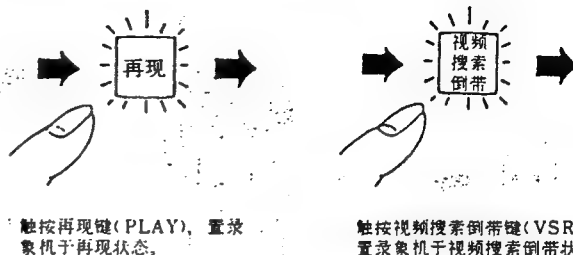
如果所测再现卷带转矩超出或不及其规定值范围，则需更换卷带盘座。

注：压一重物于测量计之上，以防其翘起。

## 视频搜索倒带状态时卷带转矩的检测和调整

### ● 拆去磁带盒室控制机构

### ● 视频搜索倒带转矩的检测



置转矩测量计于供带盘座之上，逆时针方向缓慢地旋转之（2～3秒/转），检查所测转矩值是否于  $170 \pm 40 \text{ g} \cdot \text{cm}$  的规定范围内。

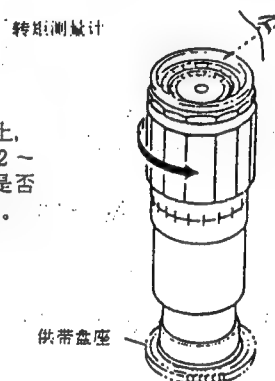


图1-32

### 注意：

应将转矩测量计牢固地安置于供带盘座之上，否则，所测值并非真实。

### ● 视频搜索倒带转矩的调整

如果所测视频搜索倒带状态时的卷带转矩超出或不及其规定值范围，则需更换卷带盘座。

### 注意：

由于供带盘旋转的不均匀性，所测转矩值有可能产生波动现象。这时应取波动值的中心值为其测定值。

## 快进状态时的反向张力的检测

- 拆去磁带盒室控制机构
- 检测反向张力

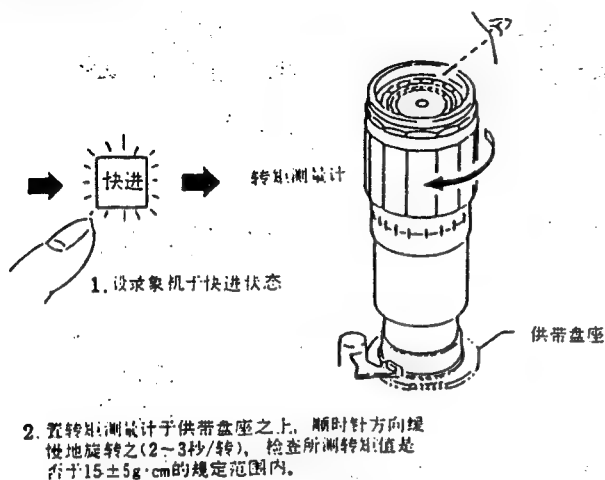


图1-33

## 视频搜索倒带状态时反向张力的检测

- 拆去磁带盒室控制机构
- 检测反向张力

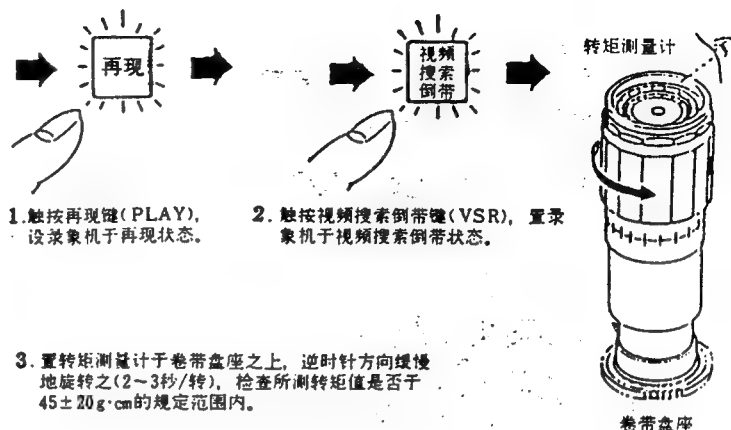


图1-35

### 注意：

应将转矩测量计牢固地安置于供带盘座之上, 否则, 所测值并非真实。

### 注意：

应将转矩测量计牢固地安置于卷带盘座之上, 否则, 所测值并非真实。

## 倒带状态时反向张力的检测

- 拆去磁带盒室控制机构
- 检测反向张力

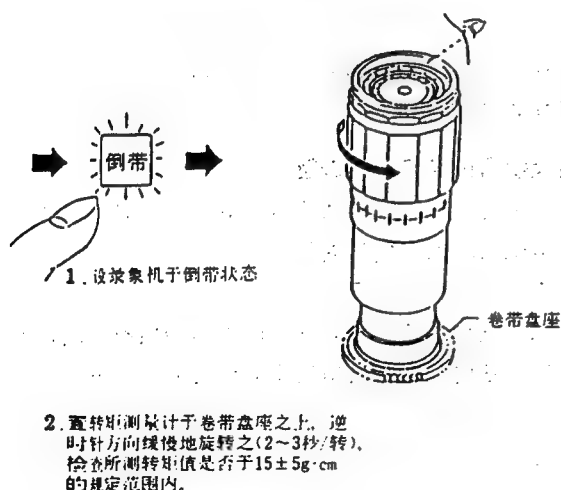


图1-34

### 注意：

应将转矩测量计牢固地安置于卷带盘座之上, 否则, 所测值并非真实。

## 紧带轮紧带压力的检测

- 拆去磁带盒室控制机构

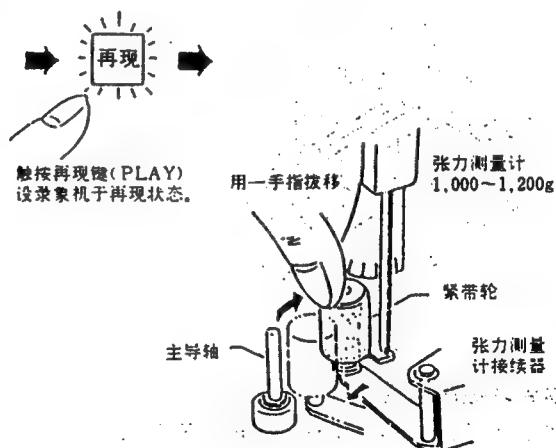


图1-36

1. 用一手指拨移紧带轮, 使之与主导轴分离。
2. 通过套挂张力测量计接续器将张力测量计设置于紧带轮轴之上。
3. 慢慢放松施于手指的压力, 让紧带轮渐渐靠拢主导轴。在紧带轮与主导轴相触的瞬间, 测量计上的读数就是所要计测的压力值。
4. 检查所测压力值是否在1,000~1,200 g 的规定范围内。

## 张力杆位置的检测和调整

- 拆去磁带盒室控制机构
- 测量计的设置

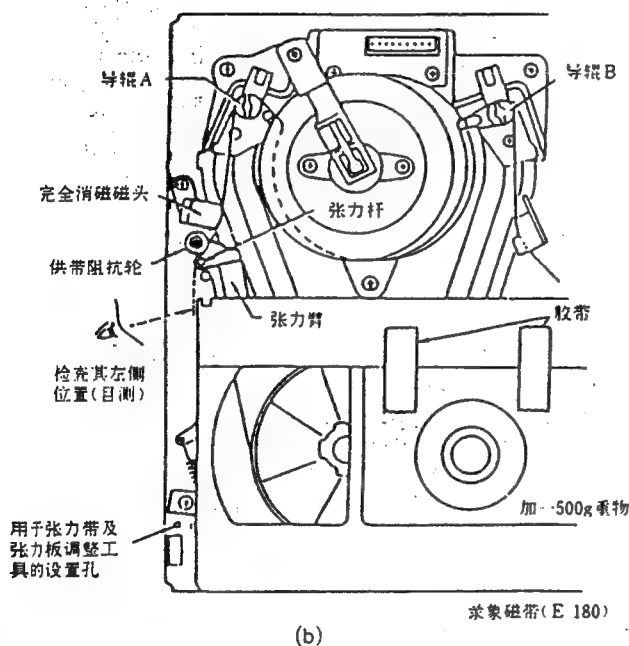
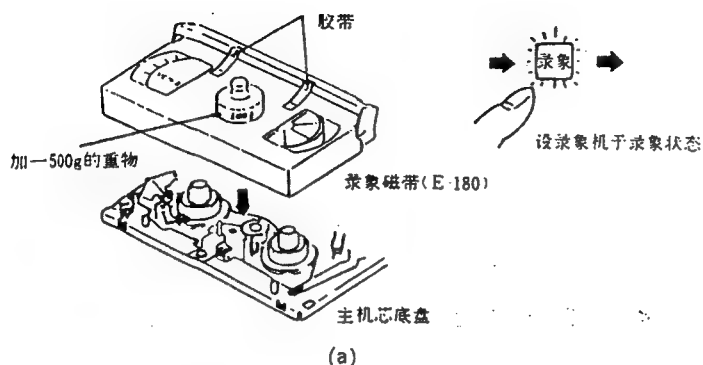


图1-37

### ● 张力杆位置的检测

1. 导辊(A和B)的作用在于从磁带盒匣中拉出磁带,与此同时,张力杆向左移动,将由导辊拉出的磁带装挂于磁头等工作位置。因此,应于其动作时(拉磁带完全装挂就位时),检查张力杆的位置是否正确。
2. 于录象磁带(E-180)始端时,通过目测检查张力杆中心位置是否与供带阻抗轮中心对齐。
3. 检查录象磁带终端是否绞带于供带阻抗轮法兰或绕过其之上。
4. 设录象机于无带盒装填的视频搜索倒带状态,检查供带盘座是否与张力带分离。

### ● 张力杆位置的调整(录象状态)

张力杆位于供带阻抗轮中心的右侧之场合:

松开紧固螺丝,用张力带及张力板调整工具沿下图箭头所指方向移动张力带调节座,以使张力杆位置移至其规定位置(左侧位置),然后,旋紧紧固螺丝即可。

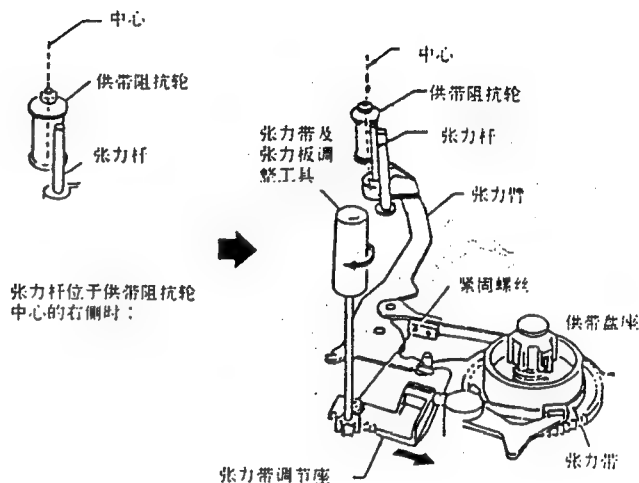


图1-38

### ● 张力杆位置的调整(录象状态)

张力杆位于供带阻抗轮中心的左侧之场合:

松开紧固螺丝,用张力带及张力板调整工具沿下图箭头所指方向移动张力带调节座,以使张力杆位置移至其规定位置(中心对齐),然后,旋紧紧固螺丝即可。

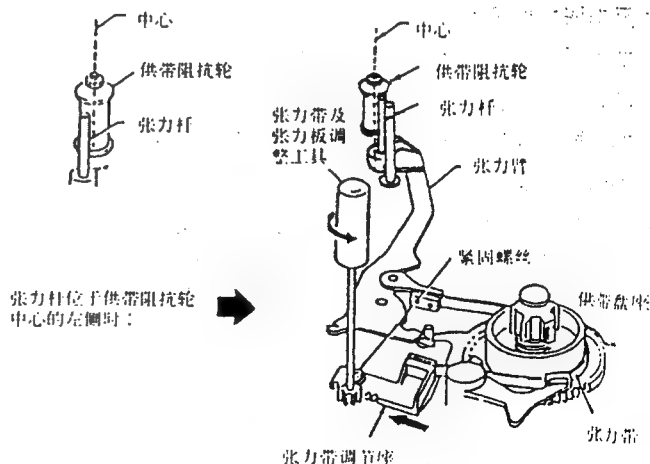


图1-39

## 录像/再现状态时反向张力的检测和调整

### A. 用盒匣磁带式转矩测量计:

#### ● 拆去磁带盒室控制机构

#### ● 反向张力的检测

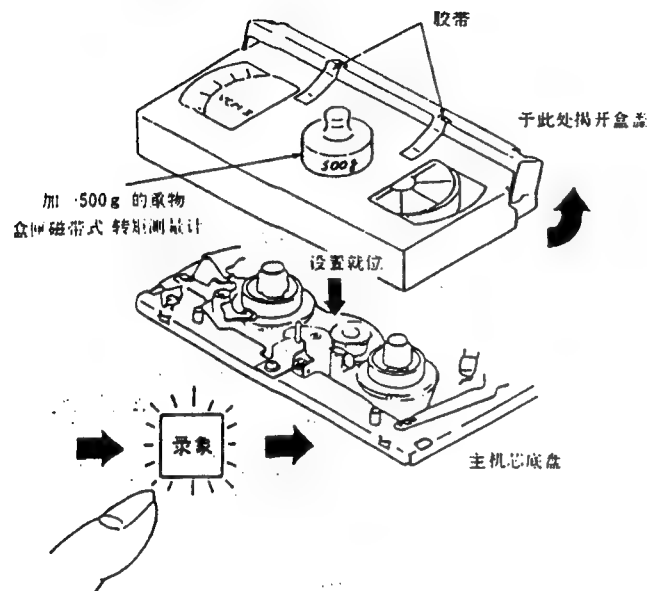


图1-40

1. 将盒匣磁带式转矩测量计设置就位。
2. 触按录像键(REC), 设录像机于录像状态。
3. 检查所测反向张力值是否在 $31 \sim 36 \text{g} \cdot \text{cm}$ 的规定范围内。

#### 注意:

1. 确认走带时, 不发生磁带高出定位导杆的现象。
2. 确认磁带自始至终不发生松弛或损伤现象。

#### ● 反向张力的调整

1. 如果所测反向张力值小于规定值, 朝下图孔A方向拨动张力弹簧扣片。
2. 如果所测反向张力值大于规定值, 朝下图孔B方向拨动张力弹簧扣片。

\* 用一小螺丝刀(一字口), 倾斜地插入其轴孔, 旋转之以更简单地朝孔A或孔B方向拨动张力弹簧扣片。

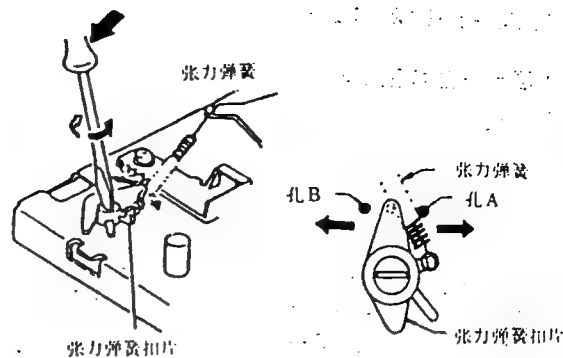


图1-41

## 制动力矩的检测

### ● 供带侧制动力矩的检测

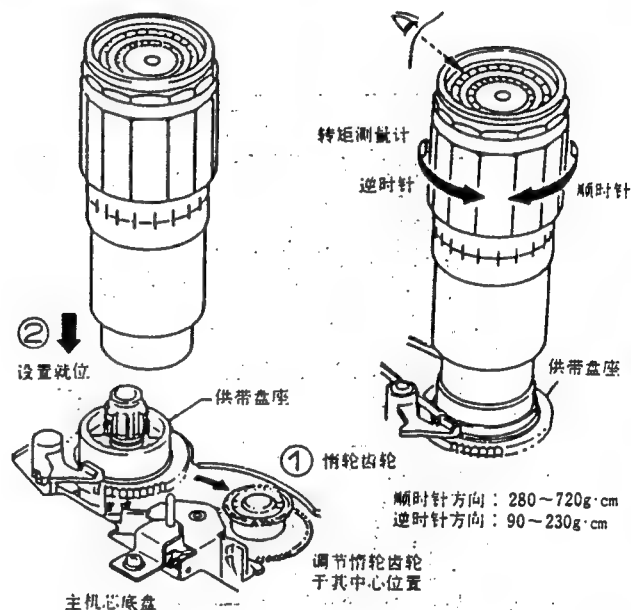


图1-42

1. 拆去磁带盒室控制机构。
2. 录像机处于快进或倒带状态时, 拔去电源引线插头, 使之处于全停状态。
3. 用手缓慢地沿供带制动的顺时针方向和逆时针方向旋转转矩测量计, 使转矩测量计的刻度盘与供带盘以同样的转速旋转。然后, 检查所测值是否满足其规定要求: 顺时针方向制动力矩 =  $280 \sim 720 \text{g} \cdot \text{cm}$ ; 逆时针方向制动力矩 =  $90 \sim 230 \text{g} \cdot \text{cm}$ 。另外, 两者所测值还得满足顺时针方向制动力矩至少等于逆时针方向制动力矩的两倍之规定要求。

## ● 卷带侧制动力矩的检测

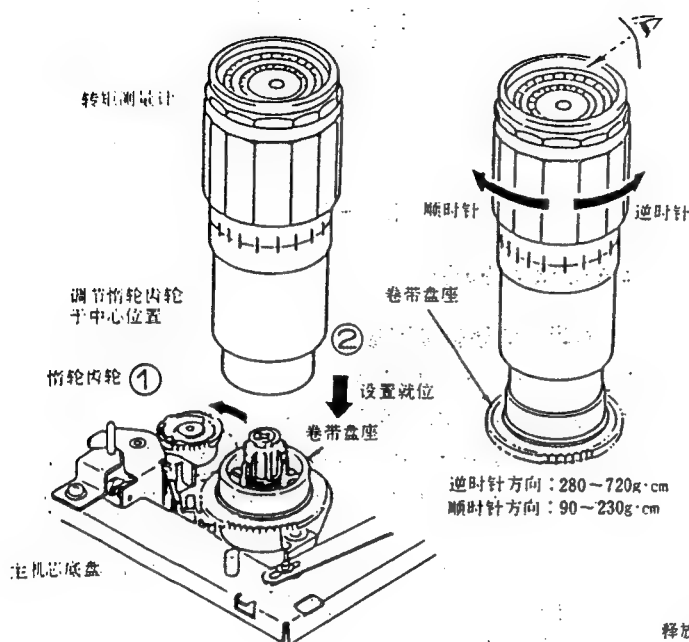


图1-43

1. 拆去磁带盒室控制机构。
2. 用手缓慢地沿卷带制动的顺时针方向和逆时针方向旋转转矩测量计，使转矩测量计的刻度盘与卷带盘以同样的转速旋转。然后，检查所测值是否满足其规定要求：逆时针方向制动力矩 = 280~720g·cm；顺时针方向制动力矩 = 90~230g·cm。另外，两者所测值还得满足逆时针方向制动力矩至少等于顺时针方向制动力矩的两倍之规定要求。

## ● 供带侧以及卷带侧制动力矩的调整

1. 如果供带侧或卷带侧制动力矩所测值不满足其规定要求，则应清擦供带盘座或卷带盘座制动杆及其垫圈，然后重新检测之。
2. 如果清擦后重测制动力矩仍不符规定要求，则需更换主制动器或主制动弹簧。

## 主制动器的更换

1. 拆下带盘皮带以及带盘装置全平电缆(FFC)。
2. 松去开口垫圈①，分离制动器拨叉。
3. 松去四支螺丝②，拆去卷带盘锁扣架。
4. 向下抽拉拆去带盘组装单元④。
5. 先松去开口垫圈③，然后拆去带盘皮带轮。
6. 松去两支螺丝④，取去惰轮组件。
7. 松开反向张力杆弹簧⑤，拆去反向张力杆⑥。(松开带盘底盘的钩扣)。
8. 松开拨叉锁门⑦，拆去制动器拨叉组件⑧。
9. 松解带盘座锁扣⑬，拆去左右带盘座组件⑨和⑩。
10. 松去主制动臂⑪以及主制动弹簧⑫。

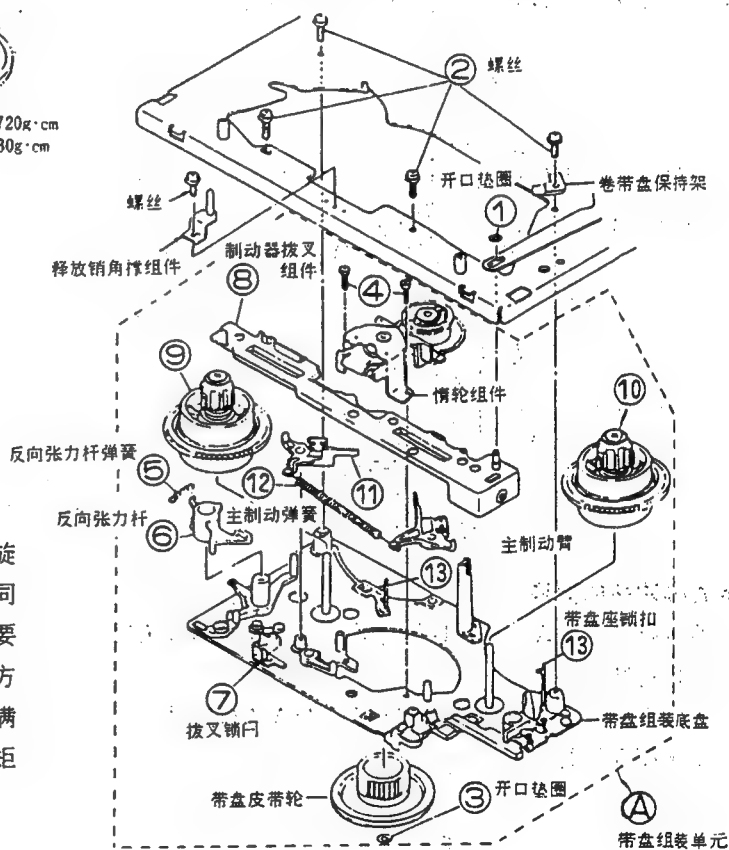


图1-44

## 注意：

主制动器一经更换，则需进行高度的检测与调整（见第93页所述），以及制动力矩的检测（见第98页所述）。



## 音频/控制(A/C)磁头的更换

1. 拆去磁带盒室控制机构。
2. 设录象机于出盒状态后, 拔去其电源引线插头。

### ● A/C磁头的拆卸

1. 松旋倾斜度调整螺丝①。
2. 松去方位角调整螺丝②。
3. 松去A/C磁头螺丝③。
4. 松焊A/C磁头印刷电路板与A/C磁头的连线。

#### 注意:

1. 拆装更换后, 必须进行磁带走行检查调整(见第102页所述)。拆装过程中, 无论是什么情况, 都不得用手或他物触碰A/C磁头。
2. 松去A/C磁头螺丝时, 注意防止其方位弹簧弹出遗失。

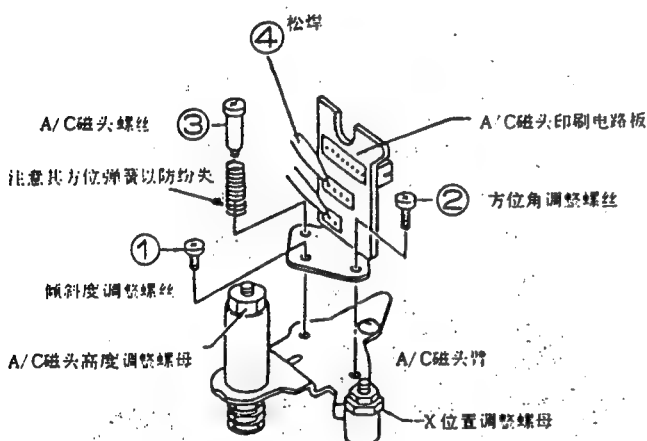


图1-45

### ● A/C磁头的更换

1. 焊接拆卸下的A/C磁头印刷电路板与更换用新A/C磁头的连线。
2. 安置A/C磁头组件, 使A/C磁头臂与A/C磁头基板大致上相互平行。

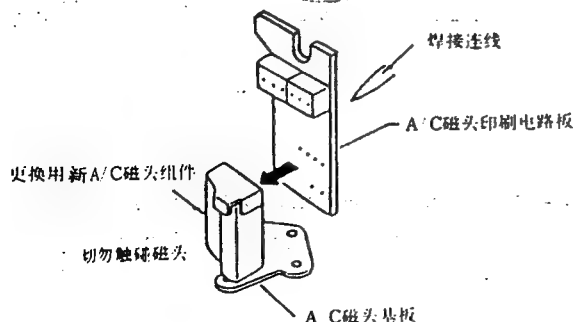


图1-46

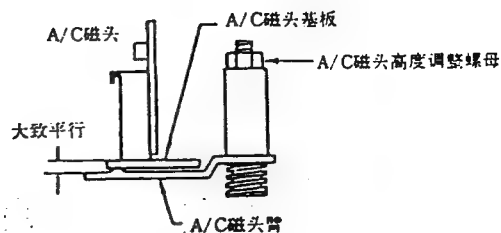


图1-47

### ● A/C磁头的调整

#### (A/C磁头的倾斜度调整)

1. 设录象机于带盒装填状态。
2. 设置A/C磁头倾斜度调整工具①就位。
3. 用一螺丝刀缓慢地转动倾斜度调整螺丝②, 直至A/C磁头与A/C磁头倾斜度调整工具间的间隙完全消去为止。

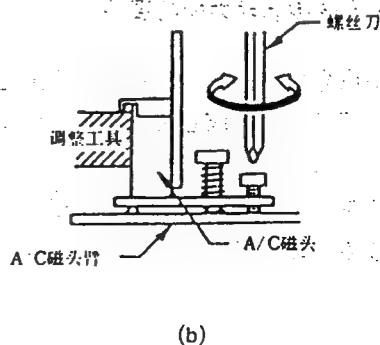
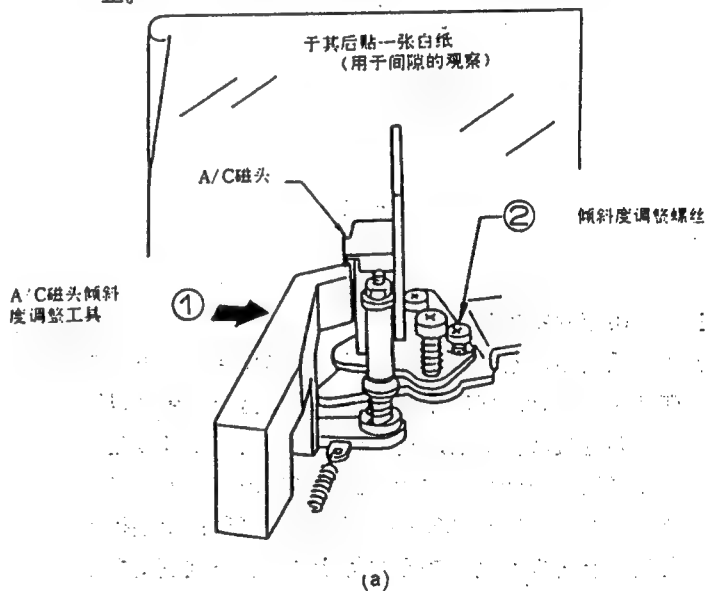


图1-48

## 〔A/C磁头的高度粗调〕

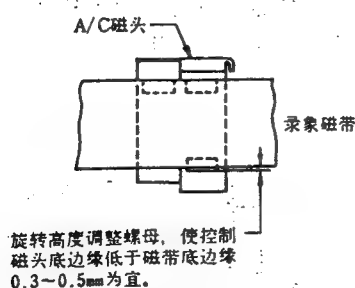
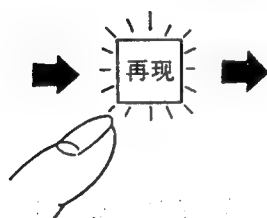
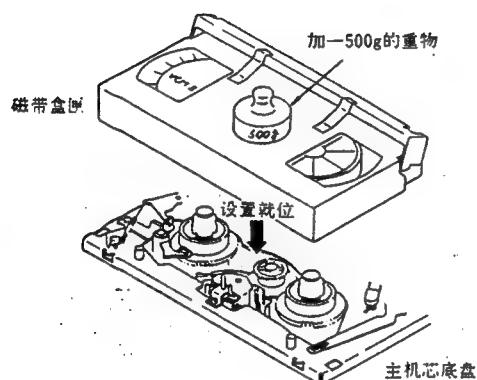
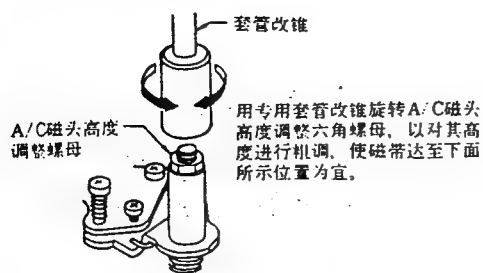


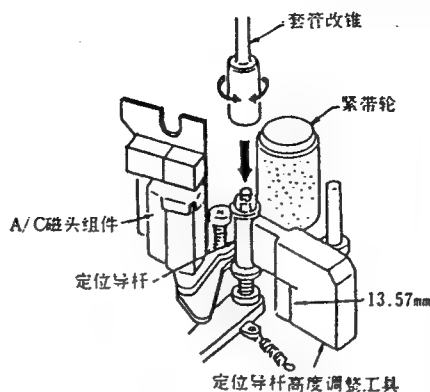
图1-49

## 定位导杆以及反转导杆的高度调整

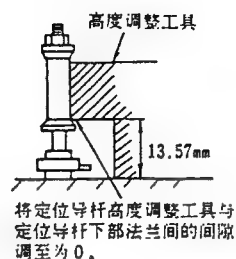
注意：

在进行磁带走行情况的粗调之前，应先用专用工具检查定位导杆的高度是否满足图1-50所示要求。

## 〔定位导杆的高度调整〕



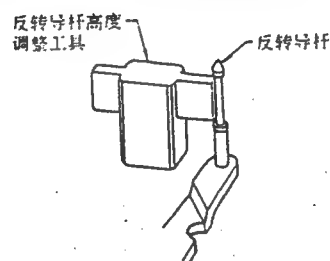
(a)



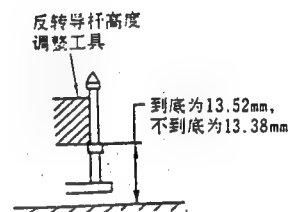
(b)

图1-50

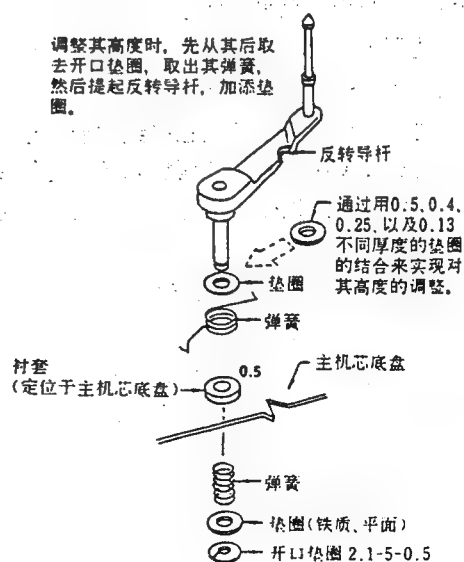
## 〔反转导杆的高度调整〕



(a)



(b)



(c)

图1-51

## 磁带走行情况的调整

1. 拆去磁带盒室控制机构。
2. 检测调整张力杆的位置。(见第97页)。
3. 检测调整视频搜索状态时的反向张力。(见第96页)
4. 设定调整A/C磁头倾斜度。(见第100页)
5. 按下述步骤对磁带走行情况进行机调。
  - a) 连接示波器于再现色彩包络线输出(TP2201)试点。设示波器同步性于外接。这样, 再现色彩信号便会被磁头转换脉冲(TP2202)所触发。
  - b) 先松开导辊底部的设定螺丝, 然后再用导辊调整专用螺丝刀(JIG DRIVERH-4) 稍微将其旋至能轻松圆滑地旋动它之程度。(见图1-52)
  - c) 将校正用磁带(单象管图案)盒匣安置于带盘座上, 然后, 将录象机设定于再现状态。  
(施加—500g的重物于带盒之上, 以防走带时带盒的翘起),

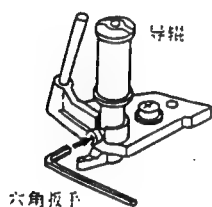


图1-52

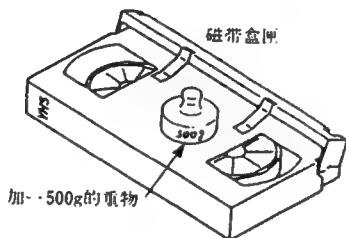


图1-53

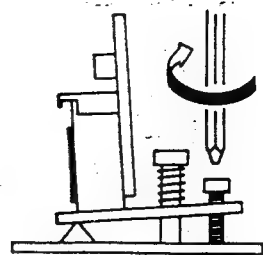
- d) 通过触按跟踪键(+)和(-), 使其输出包络线波形从最大调至最小或最小调至最大。这时, 观察其输出包络线波形是否达至平坦状态。
- e) 如通过上述调节, 其输出包络线波形无法达至平坦状态, 则需用导辊调整用螺丝刀, 对供带侧和卷带侧的导辊进行粗调, 直至输出包络线波形达至平坦。
- f) 用螺丝刀旋转A/C磁头倾斜度调整螺丝而进行A/C磁头倾斜度的调整, 以防由上部与下部法兰在磁带上起皱。

1) 由上部法兰起皱时: 如下图1-54(a)所示那样顺时针方向旋转倾斜度调整螺丝而进行调整。

2) 由下部法兰起皱时: 如下图1-54(b)所示那样逆时针方向旋转倾斜度调整螺丝而进行调整。

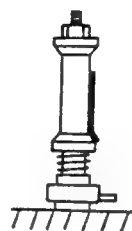


由上部法兰而起皱

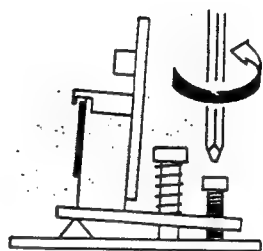


顺时针方向

(a)



由下部法兰而起皱



逆时针方向

(b)

图1-54

### 注意:

1. 将跟踪调节控制钮设定于其中间位置, 然后调整X位置调整螺母, 使再现色彩包络线波形达其最大, 以便进行磁带走行情况的粗调。
2. 粗调过程中, 应特别注意对其输出波形等的观察。



图1-55

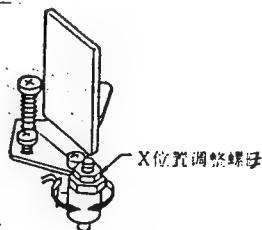
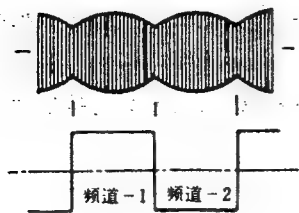


图1-56

再现彩色输出包络线(TP-2201)

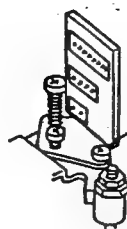


磁头开关脉冲(TP-2202)

图1-57

#### 6. A/C磁头高度和方位角的调整

- 连接示波器于音频输出端。
- 装入校正用磁带、再现之，让其输出 6 kHz 的音频信号（其视频信号为单象管图形）。用十字口螺丝刀旋转 A/C 磁头方位角调整螺丝，使示波器上音频输出达其最大。（见图1-58）。
- 再现校正用磁带，让其输出 1kHz 的音频信号（其视频信号为彩条图形）。用专用套管改锥缓慢地旋转 A/C 磁头高度调整螺母，使示波器上音频输出达其最大。
- 重复步骤 b) 的调整。
- 完成上述步骤后，浇粘合剂(LOCTITE)于方位角调整螺丝和高度调整螺母之上，封固之。



方位角调整螺丝

套管改锥

A/C磁头高度调整螺母

图1-58

图1-59

#### 7. 走带系统以及 X 位置的调整。

- 连接示波器于试点 TP2201，作再现彩色包络线输出。设示波器同步于外接。这样，再现彩色信号将被磁头开关脉冲(TP2202)所触发。
- 再现走带检查用校正磁带。
- 触按跟踪键的 (+) 或 (-)，使输出包络线波形从最大转至最小，然后又从最小转为最大。用高度调整用螺丝刀调整供带盘侧和卷带盘侧导辊的高度，使输出包络线尽可能达至平坦。
- 如果走行中的磁带低于或高于螺旋扫描导前，再现彩色输出便会呈现图1-60所示波形。
- 按第102页步骤 5 的项目 e) 要求，调节输出包络线的最大平坦度。

	磁带高于螺旋扫描导前		磁带低于螺旋扫描导前	
	供带侧	卷带侧	供带侧	卷带侧
调整	顺时针方向旋转供带盘侧导辊(导辊降低)，使其输出波形包络线达至平坦。	顺时针方向旋转卷带盘侧导辊(导辊降低)，使其输出波形包络线达至平坦。	逆时针方向旋转供带盘侧导辊(导辊升高)，让磁带高过螺旋扫描导前。然后，顺时针方向旋转供带盘侧导辊，使其输出波形包络线达至平坦。	逆时针方向旋转卷带盘侧导辊(导辊升高)，让磁带高过螺旋扫描导前。然后，顺时针方向旋转卷带盘侧导辊，使其输出波形包络线达至平坦。

图1-60

f) 触按跟踪键的(+)或(-), 检查包络线波形的平坦度反应。

g) 于磁带卸挂状态, 用导辊设定螺丝紧固导辊。

h) 再现走带检查用校正磁带, 检查输出包络线波形是否发生变化。

## 8. A/C磁头X位置的调整

a) 同时触按跟踪键的(+)和(-), 其意为设其于预设(PRESET)状态。

b) 用螺丝刀旋转A/C磁头X位置调整螺母, 以调整A/C磁头X位置, 以得磁头开关脉冲下侧的最大包络线。

c) 调整再现转换点。

d) 再现一录象磁带, 检查输出包络线波形以及声音的平坦度是否满足要求。

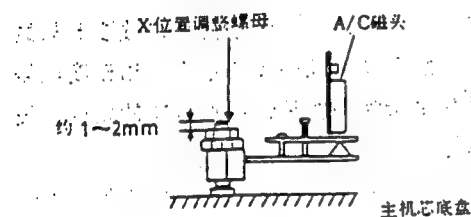


图1-61

## 主导轴直接驱动马达的拆卸和组装

1. 拆去磁带盒室控制机构。

## ●直接驱动马达的拆卸(按图中所示顺号进行)

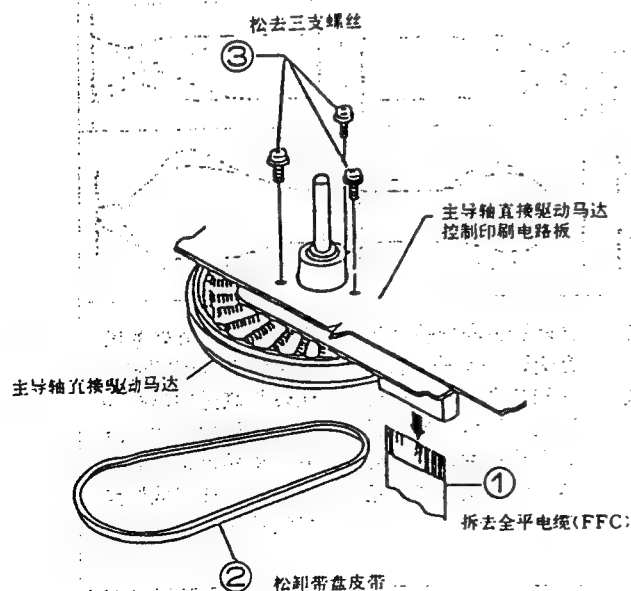


图1-62

## ●直接驱动马达的组装

1. 将主导轴直接驱动马达就位于主机芯底盘。这时, 应注意不要让主导轴磕碰主机芯底盘。然后, 用三支螺丝将其紧固。

2. 插接全平电缆(FFC)于主导轴直接驱动马达控制印刷电路板。

3. 套上带盘皮带。

注意:

1. 组装完毕, 转动主导轴直接驱动马达, 检查其转动是否圆滑。

2. 检测, 调整其伺服电路。

## 磁带装挂齿轮组的拆卸和组装

1. 拆去磁带盒室控制机构。

2. 松下带盘皮带。

3. 拆下带盘装置单元。

## ●齿轮组的拆卸

注意:

1. 拆卸时应小心谨慎, 切勿使如图1-63所示卡扣于卷带盘装挂齿轮以及供带盘装挂齿轮上的部件变形损伤。



图1-63

2. 拆卸磁带装挂齿轮时, 请用橡皮带或其它固定导辊, 以免再组装时的麻烦。

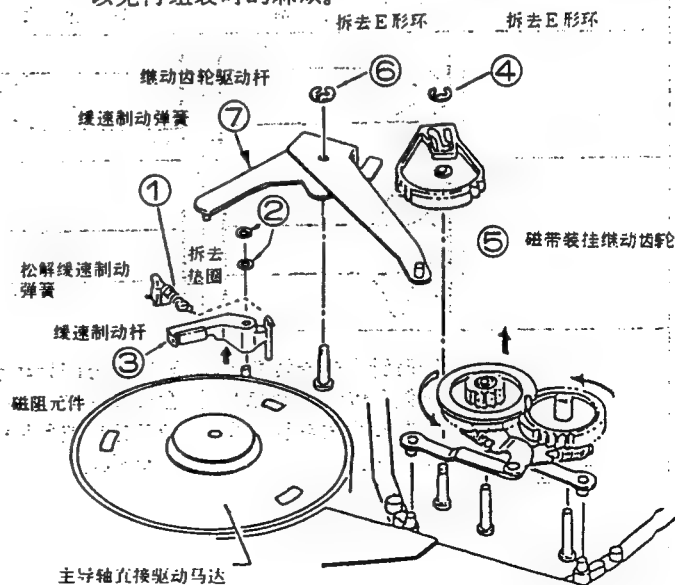


图1-64

1. 松解缓速制动弹簧①。
2. 拆去开口垫圈②。
3. 拆去缓速制动杆③。
4. 拆去E形环④。
5. 顺装挂旋转方向转动卷带盘磁带装挂齿轮及其装挂臂组件以及供带盘磁带装挂齿轮及其装挂臂组件，将两者⑤拆卸之。
6. 拆去E形环⑥。
7. 拆去继动齿轮驱动杆⑦。

#### ● 齿轮组的组装

按拆卸步骤的相反顺序进行组装。组装中，注意对齐下图所示的齿轮啮合记号。

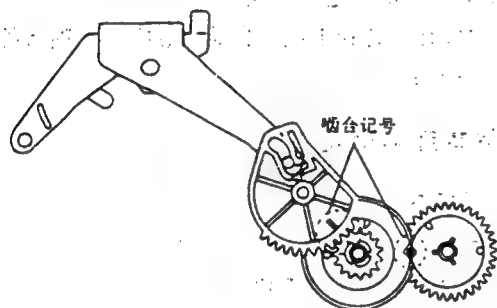


图1-65

#### 注意：

1. 组装后，须向下述部件加注特殊规格的润滑油：各齿轮的全部轮齿，各齿轮轴以及磁带装挂继动齿轮的凸轮槽榫。
2. 切勿造成供带盘及卷带盘的磁带装挂臂的变形和损伤。
3. 切勿弄脏缓速制动杆的毡垫。
4. 切勿让主导轴直接驱动马达的外表面沾染尘埃。（否则，磁阻元件可能会受损害。）
5. 切勿让缓慢制动轴盖以及供带 / 卷带盘磁带装挂齿轮的防落钩扣的变形超过其规定要求范围。

#### 装带装置的拆卸和组装

##### ● 装带装置的拆卸

1. 松去连接于装带装置上的引线①。
2. 松下带盒装填皮带②。
3. 松去三支螺丝③。
4. 向上拉出装带装置。

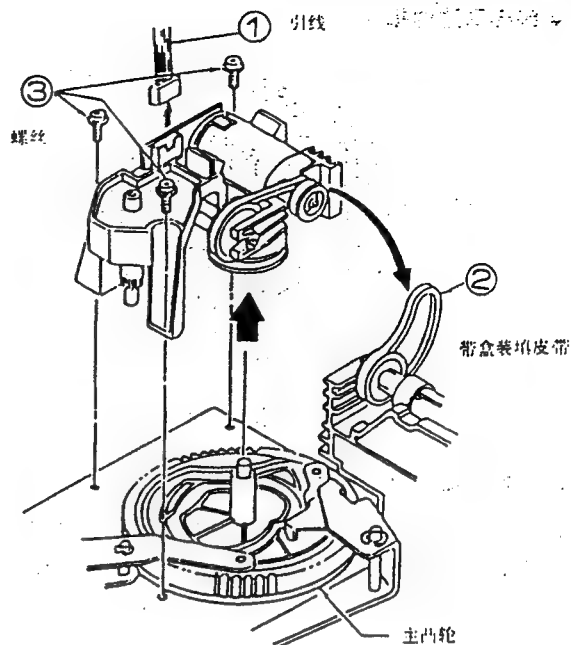


图1-66

#### 注意：

如使用带磁螺丝刀进行拆卸，请注意切勿让带磁螺丝刀触碰A/C磁头。

##### ● 装带装置的组装

1. 逆时针方向满转主凸轮。
2. 对齐凸轮开关的啮合记号。将装带装置与主凸轮相互就位组合，用三支螺丝固定之。

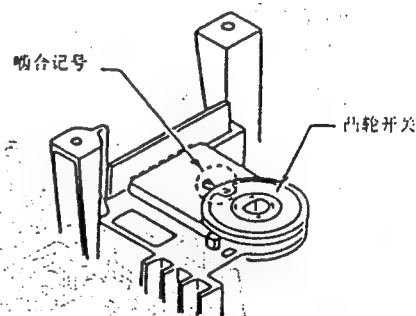


图1-67

3. 最后，连接引线，挂上带盒装填皮带。

#### 注意：

1. 切勿碰伤齿轮。
2. 切勿弄脏皮带。如将皮带弄脏，务必用指定清洁剂清洗之。

#### 装带马达的拆卸和组装

1. 将录象机设置于出盒状态。
2. 从电源插座中拔出电源引线插头。
3. 按上述步骤的说明和要求拆去装带装置。

## ●装带马达的拆卸

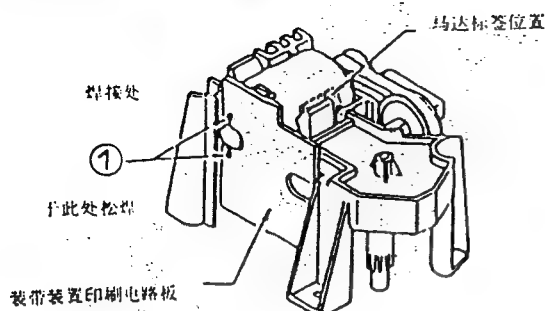


图1-68

1. 松焊连接于装带马达的引线①。
2. 解除凸轮开关卡扣于装带装置上的左右销扣②。拆下凸轮开关及装带装置印刷电路板。(见图1-69)

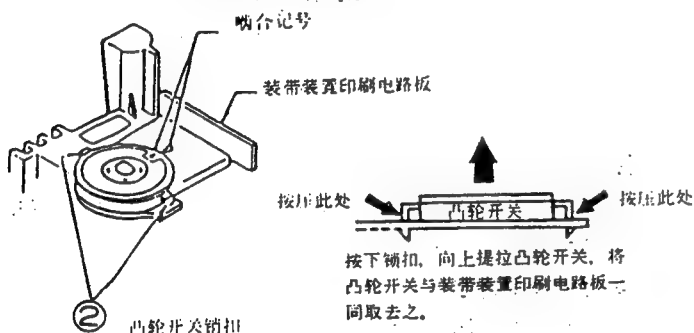


图1-69

3. 松去装带马达的皮带③。
4. 插螺丝刀或类似之物的端部于图1-70所示的间隙中，撬推装带马达的后部，将其取出。

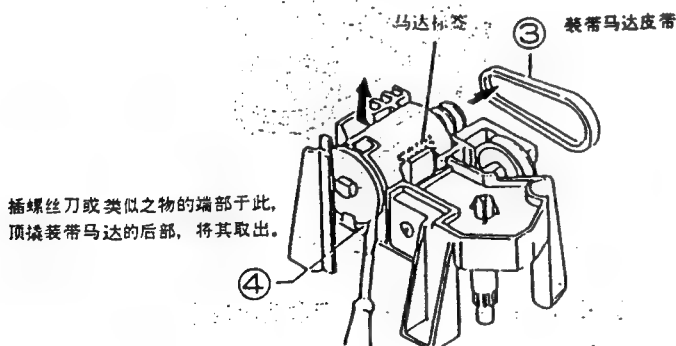


图1-70

## ●装带马达的组装

1. 拆去装带马达后，按图1-71所示要求将一新的装带马达安装即位。
2. 按图1-71所示要求安置新准备的装带马达，使马达处于其标签即目可视之位置，并使装带马达轴的螺孔与装带装置上的突出部准确相对，带有箭头标记的马达尾端与之相互对齐。

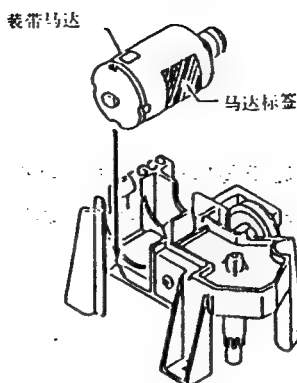


图1-71

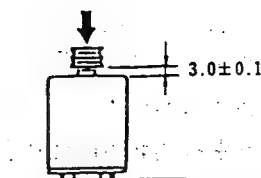


图1-72

注意：  
将马达皮带轮压入位时，其压按力不得大于5kg，马达端头与皮带轮之间的距离不得超过 $3.0 \pm 0.1$ mm的规定范围。

3. 安置装带装置的印刷电路板以及凸轮开关于位。
4. 焊接连接于装带马达的引线。
5. 最后，安置装带装置于位。(见第105页有关项目所述)。
6. 挂上装带皮带。

## 主凸轮的拆卸和组装

### ●主凸轮的拆卸

1. 拆去E形环①。
2. 拆去磁带半载装挂驱动杆②。
3. 拆去E形环③。
4. 拆去紧带轮柄④。
5. 向上拉出主凸轮⑤。

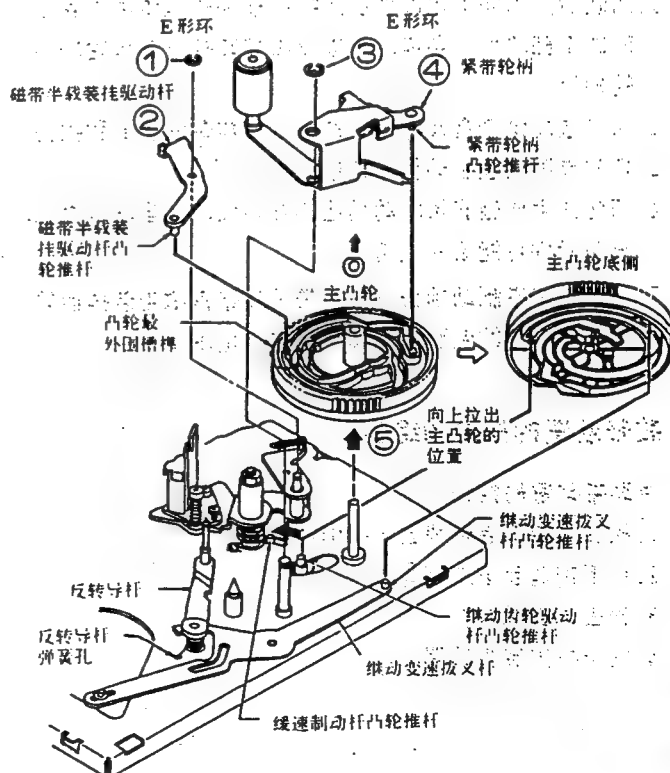


图1-73

### ●主凸轮的主装

1. 置继动齿轮驱动杆于磁带装挂卸除状态之位置。
2. 移动继动变速拨叉杆，使之与主机芯底盘上的反转导杆弹簧孔相触。用手指松卸缓速制动杆，使之与主导轴分离之（按图中箭头所指）。然后，将主凸轮 D 形切去部分面向图中箭头所指方向安置就位。
3. 置半载往复杆凸轮推杆于主凸轮最外侧的槽榫之中（按图中箭头所指）。然后，套上 E 形环，安上半载往复杆。
4. 沿顺时针方向转动主凸轮少许，让紧带轮柄凸轮推杆进至主凸轮的槽榫之中（按图中箭头所指），然后安上紧带轮柄，套上 E 形环。
5. 用手旋转主凸轮，检查四杆（继动齿轮驱动杆，继动变速拨叉杆，半载往复杆以及紧带轮柄）是否均正确地嵌入主凸轮的槽榫。
6. 装上装带装置。（见第105页有关项目所述）

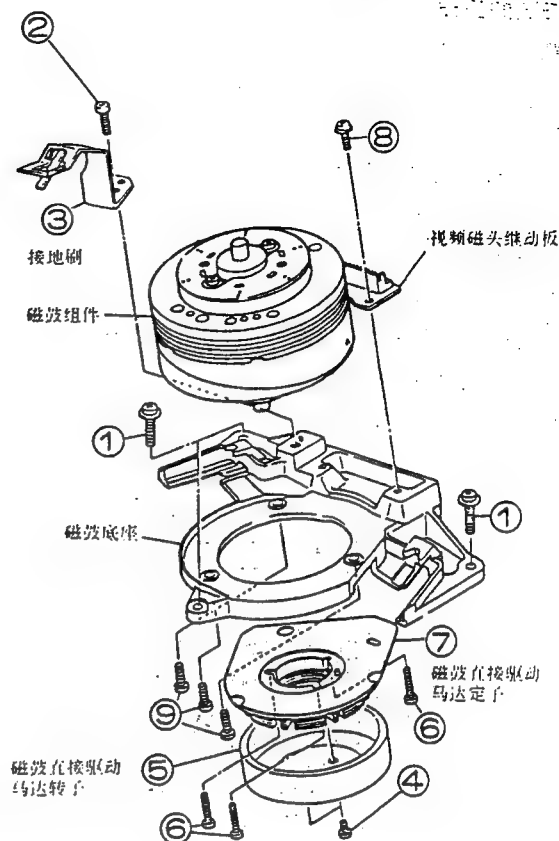
#### 注意：

1. 切勿损伤主凸轮的轮齿以及槽榫。
2. 主凸轮安置完毕，装带装置安置之前，务必先用手转动主凸轮，检查各杆是否正确就位。否则，马达开转时，有造成主凸轮以及各杆损坏之可能。
3. 加注规定之油于主凸轮各槽榫以及轮齿加以润滑。

### 磁鼓组件的装卸

#### ●磁鼓的拆卸

1. 从视频磁头继动板拆去前置放大器印刷电路板。
2. 拆去机壳底板（请参照机壳部件图中No603）。
3. 拆去磁鼓直接驱动马达连接器（ME）。
4. 松去磁鼓底座安装螺丝①，从主机芯底盘取出磁鼓组件。
5. 松去接地刷组件的紧固螺丝②，拆去接地刷组件③。
6. 松去磁鼓直接驱动马达转子的两只安装螺丝④，取出磁鼓直接驱动马达转子⑤。
7. 松去磁鼓直接驱动马达定子的三只安装螺丝⑥，取去磁鼓直接驱动马达定子⑦。
8. 松去视频磁头继动板的两只安装螺丝⑧。
9. 松去磁鼓组件的三只安装螺丝⑨，从磁鼓底座上取出磁鼓组件。



#### 注意：

组装固定磁鼓直接驱动马达转子组件时，必须将其安装孔与下部磁鼓的安装孔对齐。

图1-74



### ●磁鼓的组装

注意：

1. 安置磁鼓就位前，必须先检查鼓盘底表面和边缘有否伤痕，有否尘埃。
2. 安置磁鼓就位前，必须先检查上部磁鼓的内部表面和底表面有否伤痕，有否尘埃。
3. 安置上部磁鼓就位时，必须保持上部磁鼓的绝对垂直，并缓慢地套入下部磁鼓。
4. 安置磁鼓组件时，必须绝对禁止尘埃杂物混入鼓盘与上部磁鼓之间。
5. 扭紧磁鼓安装螺丝时，不得用力过度。

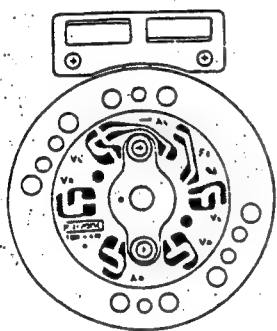


图1-75

1. 将新磁鼓设置就位。
2. 将视频磁头继动板印刷电路设置于图示位置，然后焊接和视头的引线。

注意：

迅速小心焊接磁鼓引线。焊接中，切勿让焊枪触碰磁头附近零件。

3. 安装完毕，先进行走磁情况检查，然后再进行下列的电气调试。
  - 1) 再现转换点的调试。
  - 2) X位置的检查和调整。
  - 3) SP和EP方式慢速跟踪预调的调整。

### 主导轴直接驱动马达的装拆

1. 设装置于磁带出盒状态。
2. 拔出电源插头。

●马达的拆卸(组装时按其相反顺序进行即可)

1. 拆去FFC(全平电缆)①。
2. 松去直接驱动马达转子组件的二支固定螺丝②。
3. 拉出直接驱动马达转子组件③。
4. 松去直接驱动马达定子组件的三支固定螺丝④。
5. 拆去直接驱动马达定子组件⑤。

注意：

1. 拆去直接驱动马达转子组件时，切勿磕碰装填继动齿轮。
2. 安装时，必须先将直接驱动马达转子组件的安装孔与下部磁鼓组件的安装孔对齐，然后紧密固定之。
3. 操作中，切勿碰伤上部磁鼓和视频磁头。
4. 安装时，必须小心谨慎，切勿损伤霍尔效应器、直接驱动马达定子、转子以及其它组成部件。
5. 更换组装完毕，必须进行再现转换点的调试。

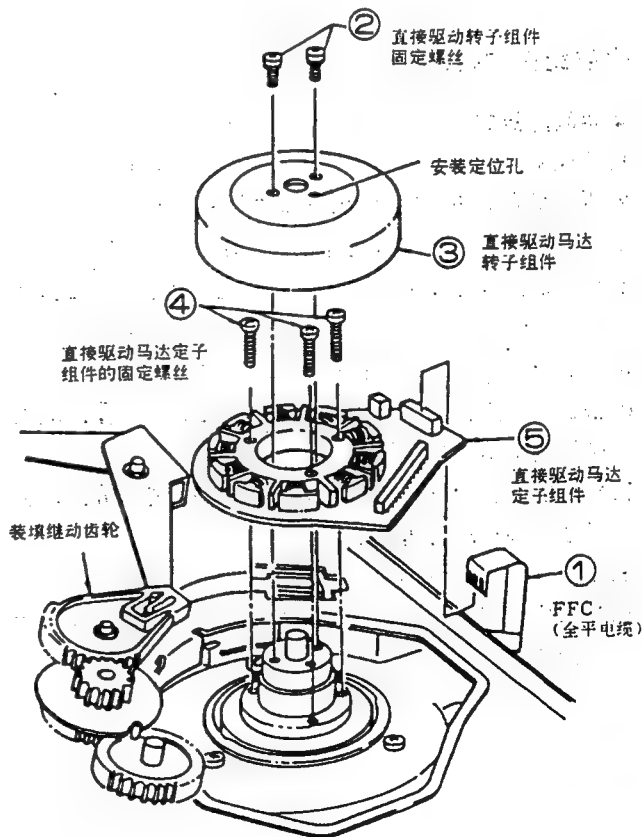


图1-76

## 自动录象头除垢器的拆换

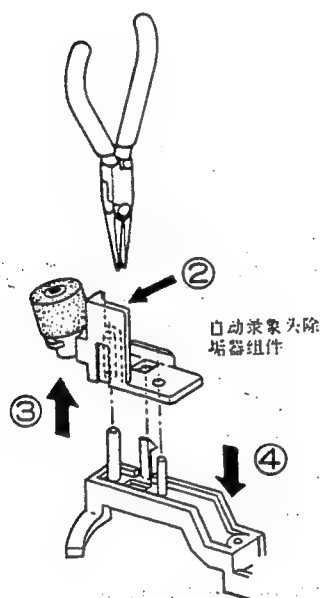
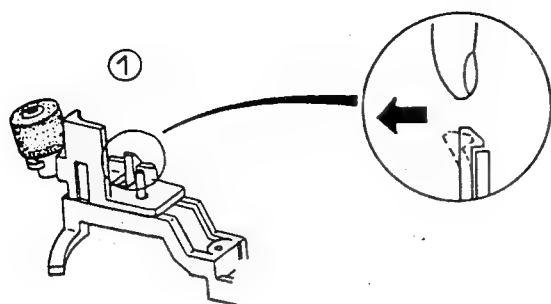


图1-77

### ●自动录象头除垢器的拆卸

按上图箭头所示方向用手指解除部件①钩扣。

用电工钳或类似之物夹住自动录象头除垢器组件②的肋缘(箭头所指处),再沿箭头③所示方向,向上拔出自动录象头除垢器组件。

### 注意:

拔出自动录象头除垢器组件时,必须先按下自动录象头除垢器松放柄。

### ●自动录象头除垢器的更换

按箭头④所示方向按下自动录象头除垢器组件。扣上部件①的钩扣。

### 注意:

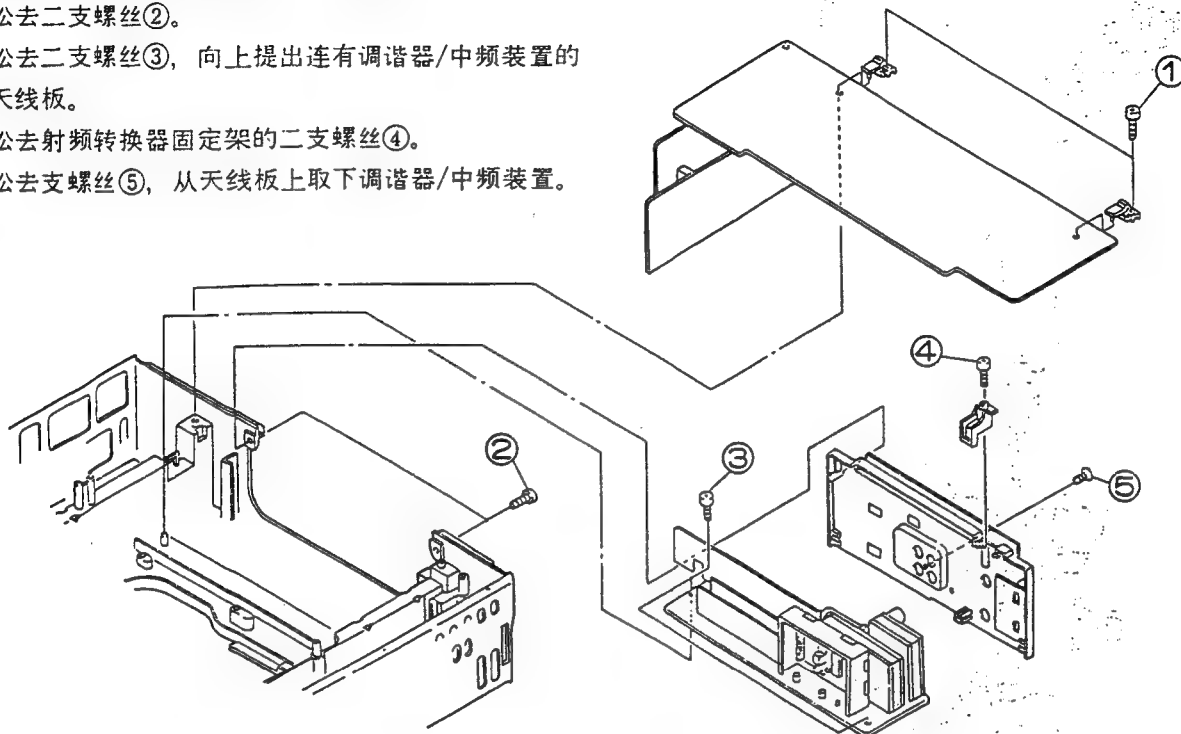
- 1.切勿让自动录象头除垢器组件触碰磁鼓。
- 2.切勿让自动录象头除垢器组件的清擦头部分沾有润滑油或其他杂物。

## 各电路的调试

### ■ 调谐器/中频 装置和电源电路装置的拆取

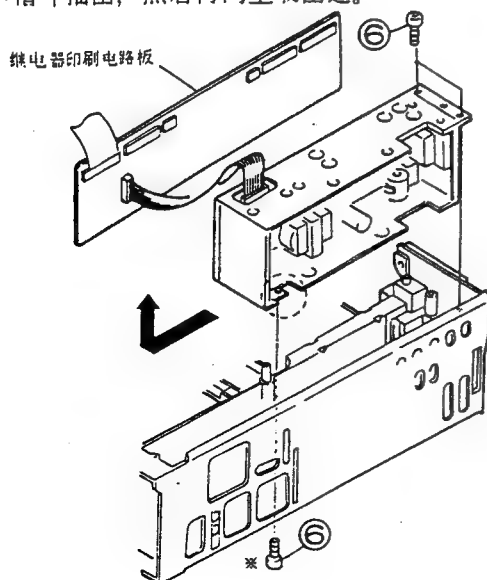
#### ● 调谐器/中频的拆取

1. 松去主电路印刷电路板的二支固定螺丝①。
2. 松去二支螺丝②。
3. 松去二支螺丝③，向上提出连有调谐器/中频装置的天线板。
4. 松去射频转换器固定架的二支螺丝④。
5. 松去支螺丝⑤，从天线板上取下调谐器/中频装置。



#### ● 电源电路装置的拆取

1. 松去电源电路装置的三支固定螺丝⑥。
2. 向上抽出继电器印刷电路板。
3. 按下图箭头所示方向，先将电源电路装置从壳体框架的卡槽中抽出，然后再向上取出之。



注意：

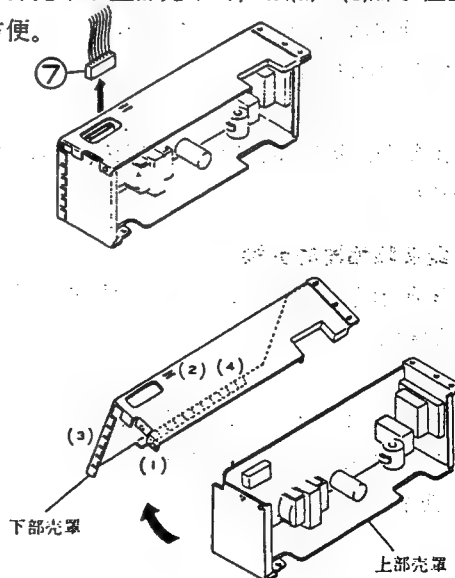
※记号所示螺丝指机壳底板紧固螺丝。

#### ● 电源电路装置保护壳罩的拆取

1. 拔去引线连接器PA⑦。
2. 向下按住上部壳罩，并按下图箭头所示方向转动下部壳罩，拆去之。

注意：

卡扣下部壳罩于上部壳罩时，按(1)~(4)所示位置之顺进行为方便。



## 电气调试

注：

### ●调试前

在更换录象机磁头之类的电子元件以及机械部件之后，经常需要进行本节所述的电气调试。

在调试之前，检查机械装置以及所有的电子元件是否处于良好的工作状态，否则，调试不能顺利完成。

### ●需要的检测用仪器

◎彩色电视机监视器

◎双踪示波器

◎交流毫伏特计

◎计频器

◎校正用磁带(VROCPSV)(PAL)

◎校正用磁带(VROATSV)(NTSC)

◎附加外接连接器(QCNW-6443GEZZ:销2)

◎甚高频频带调幅信号发生器

◎彩条信号发生器

◎直流电电源

◎音频信号发生器

◎直流伏特计

◎Hi-Fi校正用磁带(VROCBFFS)(PAL)

◎校正用磁带(VRONBZZS)(NTSC)

◎校正用磁带(VR9EBZCS)(NTSC)

◎空白录象带

◎调试用螺丝刀

◎场强计

### 电源电路的调试

检测仪器	直流伏特计
工作状态	录象
测试点	AP连接器的销④和接地 (安装在主组件上)
调整点	R916 调试控制
规定要求	$6.6 \pm 0.1V$

1. 将录象机置于录象工作状态，以及将直流伏特计与AP连接器的销4(+)及接地(-)连接。  
(AP连接器安装在主组件上。)
2. 接录象机于额定电源。
3. 将螺丝刀插入柜架右侧的调节孔内，调节安装在电源组件PWB上的R916，直至伏特计的读数为直流  $6.6 \pm 0.1V$ 。

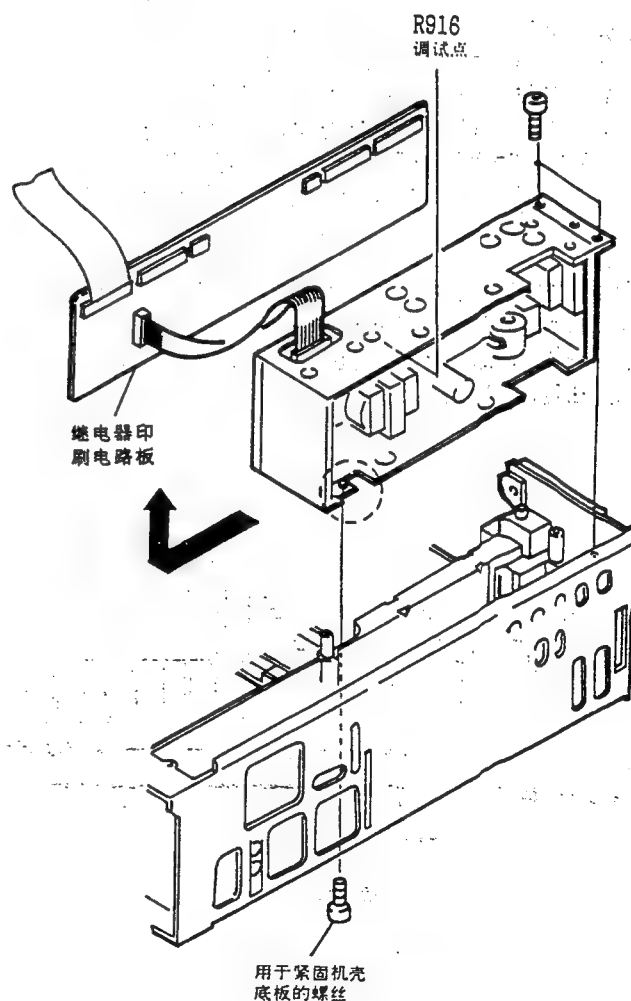


图2-1

## 伺服电路的调试

### PAL制式再现转换点的调试

检测仪器	双踪示波器
工作状态	再现 (跟踪旋钮于其正中)
带盒	校正用磁带 (VROCPSV)
测试点	频道-1: TP2202 频道-2: 视频输出 端子 (频道-1触发倾斜开关于(+), 内触发于频道-1)
调整点	R701 PAL相位发生器 M.M. 调节控制
规定要求	$6.5 \pm 0.5H$

1. 松开前面板
2. 插入PAL制式的校正磁带(VROCPSV), 再现之。
3. 置跟踪按钮于其中央位置。(见“注”中所述)
4. 将双踪示波器与视频输出端及TP2202连接。  
(频道-1触发倾斜开关于(+), 内触发于频道-1。)
5. 调节 R701, 使磁头开关脉冲前沿走出垂直同步  
6.5H(行)(示于图2-2)。

注:  
置跟踪按钮于其中央位置的方法。(只有再现状态)  
①折去盒室机构控制组件。  
②用一根引线短接TEST26和TEST27的搭接销(安装在定时器组件上)

### PAL制式SP方式慢速跟踪的预调

检测仪器	彩色电视机监视器
工作状态	插入自录磁带, 录象后再现之 (参阅下面的注①)
输入信号	电视台节目或视频信号 (外部输入选择开关)
测试点	电视机监视器屏幕
调整点	跟踪调节按钮(+)或(-)
规定要求	电视机监视器屏幕上出现最小的 噪声线

1. 要让录象机接收一种电视台节目信号或者向外接视频输入端输入视频信号。
2. 插入自录磁带, 用PAL制式SP方式再现之。
3. 用一根引线短接TEST26和TEST27的搭接销, 设录象机于测试状态。(参阅下面的注②)
4. 确认电视机荧光显象管亮启正常, 然后拆去引线。
5. 触按摇控器上的慢放按钮, 以及慢动作再现录有内容的磁带部分。
6. 观察电视机监视器屏幕, 同时触按录象机本体或摇控器上的(+)或(-)跟踪按钮, 调整跟踪控制, 直至噪声线从电视机监视器屏幕上完全消失。
7. 触按停止按钮, 跟踪的预调数据被自动记忆之。
8. 触按完全取消按钮, 让录象机回至标准工作状态。

注:  
①自录磁带指的是一种由被调整的录象机记录程序的带盒。  
②TEST26和TEST27的搭接销位于定时器模块TA连接器侧上方。

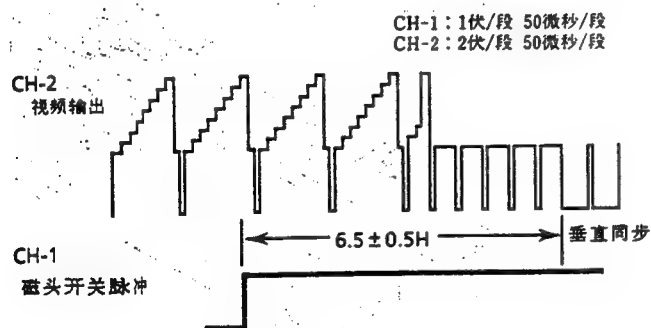


图2-2

## PAL制式LP方式慢速跟踪的预调

检测仪器	彩色电视机监视器
工作状态	插入自录磁带，录象后再现之 (参阅下面的注①)
输入信号	电视台节目或视频信号 (外部输入选择开关)
测试点	电视机监视器屏幕
调整点	跟踪调节按钮(+)或(-)
规定要求	电视机监视器屏幕上出现最小的 噪声线

1. 要让录象机接收一种电视台节目信号或者向外接视频输入端输入视频信号。
2. 插入自录磁带，用PAL制式LP方式再现之。
3. 用一根引线短接TEST26和TEST27的搭接销，设录象机于测试状态。(参阅下面的注②)
4. 确认电视机荧光显象管亮启正常，然后拆去引线。
5. 触按摇控器上的慢放按钮，以及慢动作再现录有内容的磁带部分。
6. 观察电视机监视器屏幕，同时触按录象机本体或摇控器上的(+)或(-)跟踪按钮，调整跟踪控制，直至噪声线从电视机监视器屏幕上完全消失。
7. 触按停止按钮，跟踪的预调数据被自动记忆之。
8. 触按完全取消按钮，让录象机回至标准工作状态

注：

- ①自录磁带指的是一种由被调整的录象机记录程序的带盒。
- ②TEST26和TEST27的搭接销位于定时器模块TA连接器侧上方。

## PAL制式暂停/静止画面垂直同步的调试

检测仪器	彩色电视机监视器
工作状态	插入自录磁带，再现静止画面 (参阅下面的注)
输入信号	电视台节目或视频信号 (外部输入选择开关)
测试点	电视机监视器屏幕
调整点	跟踪调节按钮(+)、(-)
规定要求	画面无垂直抖动

1. 要让录象机接收一种电视台节目信号或者向外接视频输入端输入视频信号。
2. 插入自录磁带，用PAL制式SP方式再现之。
3. 触按录象机本体或摇控器上的暂停/静止按钮，以及以SP方式再现录有内容的磁带部分。
4. 观察电视机监视器屏幕，同时触按录象机本体或摇控器上的(+)或(-)跟踪按钮，使电视机监视器屏幕上的噪声抖动达至最小程度。
5. 触按停止按钮，暂停/静止的预调数据被自动记忆之。

注：

自录磁带指的是一种由被调整的录象机记录程序的带盒。

## NTSC制式再现转换点的调试

检测仪器	双踪示波器
工作状态	再现（跟踪按钮于其正中）
带盒	校正用磁带（VROATSV）
测试点	频道-1：TP2202 频道-2：视频输出 端子（频道-1触发倾斜开关于+）， 内触发于频道-1）
调整点	R704 NTSC相位发生器 M.M.调节控制
规定要求	$6.5 \pm 0.5H$

1. 松开前面板。
2. 插入NTSC制式的校正磁带（VROATSV），再现之。
3. 置跟踪按钮于其中央位置。（见“注”中所述）
4. 将双踪示波器与视频输出端及TP2202连接。（频道-1触发倾斜开关于+），内触发于频道-1。）
5. 调节 R704，使磁头开关脉冲前沿超出垂直同步
6.  $5H$ （行）（示于图2-3）。

注：  
置跟踪按钮于其中央位置的方法。（只有再现状态）  
①拆去盒室机构控制组件。  
②用一根引线短接TEST26和TEST27的搭接销，（安装在定时器组件上）。

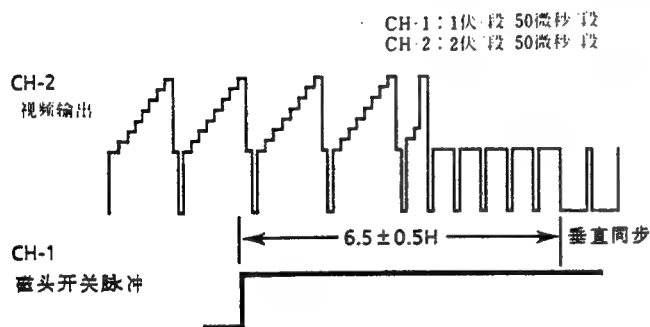


图2-3

## NTSC制式SP方式慢速跟踪的预调 电视机监视器屏幕上出现最小的噪声线

检测仪器	彩色电视机监视器
工作状态	再现（SP方式再现）
带盒	校正用磁带（VRONBZZS：SP方式）
测试点	电视机监视器屏幕
调整点	跟踪调节按钮（+）、（-）
规定要求	电视机监视器屏幕上出现最小的 噪声线

1. 插入NTSC制式校正磁带（VRONBZZS），以SP方式再现录有内容的磁带部分。
  2. 用一根引线短接TEST26和TEST27的搭接销，设录像机于测试状态。（参阅下面的注）
  3. 确认电视机荧光显象管亮启正常，然后拆去引线。
  4. 触按摇控器上的慢放按钮，以及慢动作再现录有内容的磁带部分。
  5. 观察电视机监视器屏幕，同时触按录像机本体或摇控器上的（+）或（-）跟踪按钮，调整跟踪控制，直至噪声线从电视机监视器屏幕上完全消失。
  6. 触按停止按钮，跟踪的预调数据被自动记忆之。
  7. 触按完全取消按钮，让录像机回至标准工作状态。
- 注：  
TEST26和TEST27的搭接销位于定时器模块TA连接器侧上方。

## NTSC制式EP方式慢速跟踪的预调

检测仪器	彩色电视机监视器
工作状态	再现（EP方式再现）
带盒	校正用磁带（VR9EBZCS：EP方式）
测试点	电视机监视器屏幕
调整点	跟踪调节按钮（+）、（-）
规定要求	电视机监视器屏幕上出现最小的 噪声线

1. 插入NTSC制式校正磁带(VR9EBZCS)，以EP方式再现录有内容的磁带部分。
2. 用一根引线短接TEST26和TEST27的搭接销，设录象机于测试状态。(参阅下面的注)
3. 确认电视机荧光显象管亮启正常，然后拆去引线。
4. 触按遥控器上的慢放键钮，以及慢动作再现录有内容的磁带部分。
5. 观察电视机监视器屏幕，同时触按录象机本体或遥控器上的(+)或(-)跟踪键钮，调整跟踪控制，直至噪声线从电视机监视器屏幕上完全消失。
6. 触按停止键钮，慢速跟踪预调数据被自动记忆之。
7. 触按完全取消键钮，让录象机回至标准工作状态。

注：

TEST26和TEST27的搭接销位于定时器模块TA连接器侧上方。

1. 插入NTSC制式校正磁带(VRONBZZS)，以SP方式再现录有内容的磁带部分。
2. 触按录象机本体或遥控器上的暂停/静止键钮，以及以SP方式再现录有内容的磁带部分。
3. 观察电视机监视器屏幕，同时触按录象机本体或遥控器上的(+)或(-)跟踪键钮，调整跟踪控制，使电视机监视器屏幕上的噪声抖动达至最小程度。
4. 触按停止键钮，暂停/静止的预调数据被自动记忆之。

注：

TEST26和TEST27的搭接销位于定时器模块TA连接器侧上方。

### NTSC制式暂停/静止画面垂直同步的调试

检测仪器	彩色电视机监视器
工作状态	静止画面再现
带盒	校正用磁带 (VRONBZZS)
测试点	电视机监视器屏幕
调整点	跟踪调节键钮(+)、(-)
规定要求	画面无垂直抖动

### ●主电路模块各调整点及测试点的位置分布

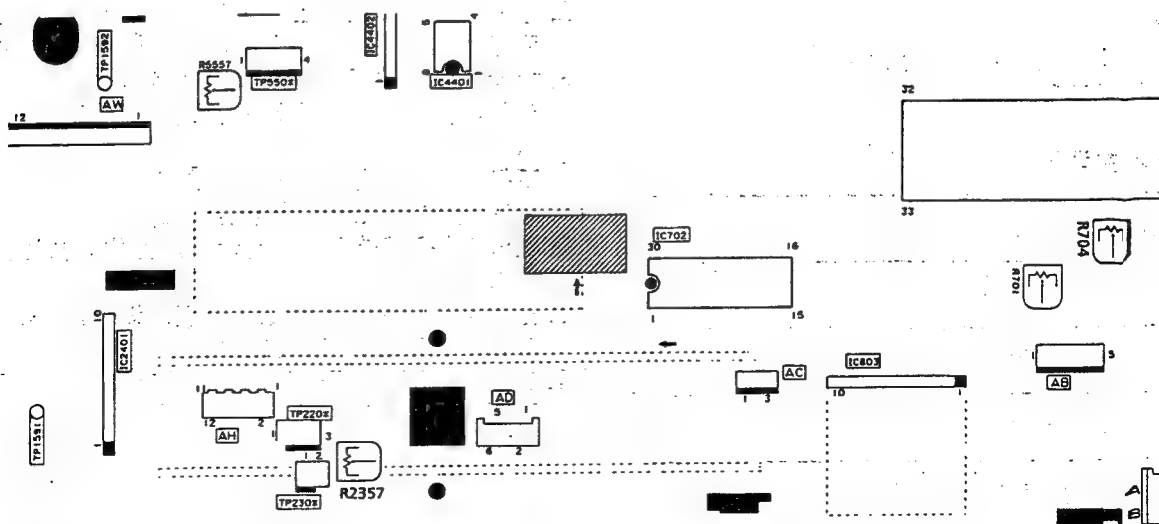


图2-4



## 亮度/色度信号(Y/C)电路的调整

### 视频E—E增益调试

检测仪器	示波器
工作状态	停止或录象工作状态 (色制: PAL)
输入信号	EBU标准彩条 (1.0Vp-p)
测试点	视频输出插座
调整点	R203 (E-E电平调节)
规定要求	$1.0 \pm 0.04V_{p-p}$

1. 把一只75 $\Omega$ 负载电阻连接到视频输出插座上, 然后把该负载电阻跨接到示波器上。  
(参阅下面的注①)
2. 把一种彩条信号输入视频输入插座上, 以及利用选择频道AV, 设录象机处于A/V工作状态。
3. 调节R203(E-E电平), 使示波器屏幕获得图2-5所示信号振幅为1.0Vp-p的规定值。

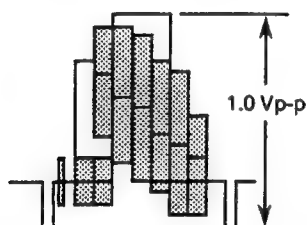


图2-5

注:

- ①假如75 $\Omega$ 负载电阻松开的话, 信号幅度会产生重叠现象。
- ②调试后, 检查调频亮度信号的偏转。  
(R204频率和亮度的调试)

### 再现Y—增益调试

检测仪器	示波器
工作状态	再现
带盒	校正用磁带 (VROCPSV)
测试点	视频输出插座
调整点	R201再现Y—增益控制
规定要求	$1.0 \pm 0.04V_{p-p}$

1. 把一只75 $\Omega$ 负载电阻连接到视频输出插座上, 然后把该负载电阻跨接到示波器上。  
(见下面“注”中所述)

2. 再现校正磁带录有彩条的部分, 调节R201, 如图2-6所示, 信号幅度达到1.0Vp-p。

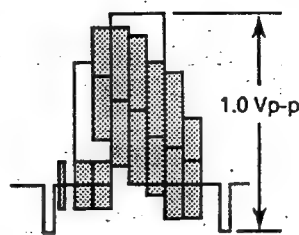


图2-6

注:

假如75 $\Omega$ 负载电阻松开的话, 信号幅度会产生重叠现象。

### 调频载波频率和偏转调试

检测仪器	计频器、示波器
工作状态	录象/再现 (色制: PAL)
输入信号	EBU标准彩条 (1.0Vp-p)
测试点	TP203 (IC201的销40) 视频输出插座
调整点	R205 (调频载波调节) R204 (偏转调节)
规定要求	$3.8 \pm 0.05\text{MHz}$ $1.0 \pm 0.04V_{p-p}$

1. 确认R203(E-E电平)的调试已符合规定要求。
2. 把一只75 $\Omega$ 负载电阻连接到视频输出插座上, 然后把负载电阻跨接到示波器上。(参阅次页的注)
3. 把计频器接到TP203~接地的测试点上。
4. 利用选择频道AV, 设录象机处于A/V输入工作状态。  
不得把任何信号输入视频输入插座。  
(折去视频输入端的信号输入线。)
5. 在该条件下调节R205, 使计频器上的读数达至3.8兆赫。
6. 把彩条信号输入视频输入插座, 调节R204, 使计频器上的读数达至4.3兆赫。
7. 在该条件下, 把EBU彩条信号录在磁带上, 倒带, 再现之。

8. 确认再现彩条信号的幅度如图2-7所示, 达至 $1.0 \pm 0.04V_{p-p}$ 。

假如彩条信号电平低于规定值, 顺时针方向旋转R204。

假如高于规定值, 逆时针方向旋转R204。之后, 重新自录, 再现之。

9. 重复7~8步骤, 直至信号电平达至规定值。

注:

假如 $75\Omega$ 负载电阻松开的话, 信号幅度会产生重叠现象。

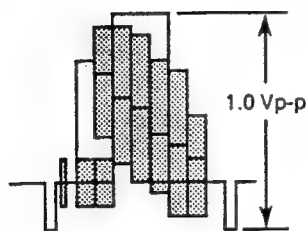


图2-7

#### Y/C录象电流的调试

检测仪器	示波器
工作状态	录象 (LP工作状态)(色制: PAL)
输入信号	EBU标准彩条 ( $1.0V_{p-p}$ )
测试点	TP301 (SIG, 信号端) TP302 (GND, 接地端)
调整点	R504 (色度控制) R208 (调频—亮度控制)
规定要求	色度(红): $23 \pm 2mV_{p-p}$ 同步脉冲顶部: $83 \pm 5mV_{p-p}$

1. 把彩条信号输入视频输入插座, 利用选择频道AV, 设录象机处于A/V工作状态。

2. 把示波器接到安装在磁头放大组件上的测试点TP301(信号)和TP302(接地)上。(请见下注)

3. 设录象机处于录象状态, 磁带速度即不是LP方式(也不是SP方式)。

4. 旋转R208, 使调频亮度信号于最小。

5. 调节R504, 使红色部分的电平幅度达至图2-8(a)所示的规定要求。

6. 调节R208, 使同步脉冲幅度达至图2-8(b)所示的规定要求。

7. 假如使用的话, 请拆去附加外接测试点。

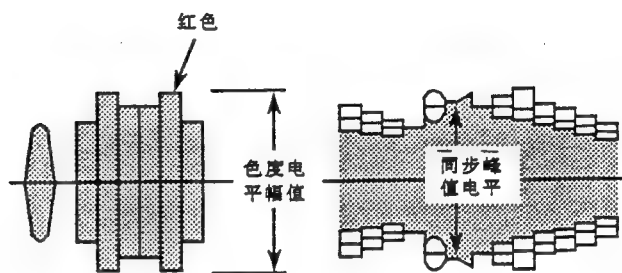


图2-8(a)

图2-8(b)

注:

为方便示波器的连接, 要在这些测试点上使用QCNW-6443GEZZ。

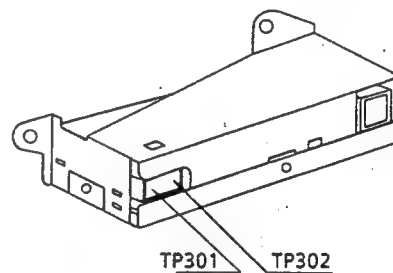
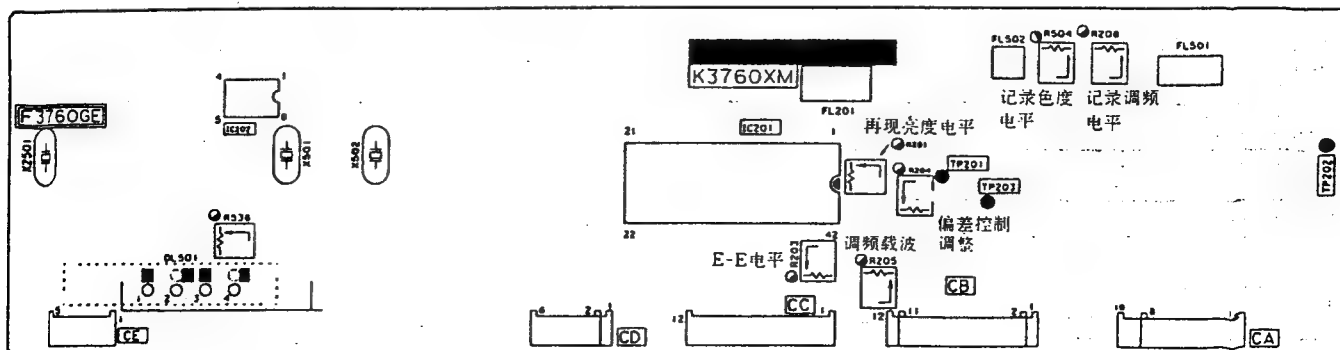


图2-9

#### ●Y/C电路模块各调整点及测试点的位置分布



## SECAM制式色度电路的调整

贝尔滤波器的调整

(仅限于VC-H91/H91ETS两型号)

检测仪器	示波器
工作状态	记录(SP方式)
输入信号	EBU标准SECAM制式彩条信号 (1.0Vp-p)
测试点	TP5302(信号)、TP5301(接地)
调整点	FL5304(4.3MHz贝尔滤波器)
规定要求	————

1. 向录象机视频输入插座插入SECAM制式彩条信号。选择“A/V”频道，设录象机于A/V工作状态。
2. 接示波器于TP5302(信号)及TP5301(接地)。(触发TP5303)
3. 设录象机于SP走带方式的记录工作状态。(非LP方式)
4. 调节FL5304(4.3MHz贝尔滤波器)，使示波器上红色与蓝色的平坦部分重合，达至图2-12的所示要求。

注：

TP5302(信号)、TP5301(接地)以及FL5304(4.3MHz贝尔滤波器)位于SECAM制式色度电路信号模块之上。



图2-12

记录均衡器的调整

(仅限于VC-H91/H91ETS两型号)

检测仪器	示波器
工作状态	记录(SP方式)
输入信号	EBU标准SECAM制式彩条信号 (1.0Vp-p)
测试点	TP5305(信号)、TP5301(接地)
调整点	FL5306(1.1MHz贝尔滤波器)
规定要求	————

1. 向录象机视频输入插座插入SECAM制式彩条信号。选择A/V频道，设录象机于A/V频道的A/V工作状态。
2. 接示波器于TP5305(信号)及TP5301(接地)。(触发TP5303)
3. 设录象机于SP走带方式的记录工作状态。(非LP方式)
4. 调节FL5306(1.1MHz贝尔滤波器)，使示波器上缘红的双重部分重合，达至图2-13的所示要求。

注：

TP5305(信号)、TP5301(接地)以及FL5306(1.1MHz贝尔滤波器)位于SECAM制式色度电路信号模块之上。

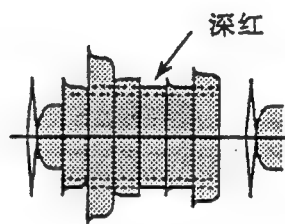


图2-13

同步选通状态的调整

(仅限于VC-H91/H91ETS两型号)

检测仪器	双轨迹示波器
工作状态	记录(SP方式)
输入信号	EBU标准SECAM制式彩条信号 (1.0Vp-p)
测试点	CH-1:TP5304(色度信号) TP5301(接地) CH-2:TP5303(水平同步信号) TP5301(接地)
调整点	R5310(同步选通调整A) R5311(同步选通调整B)
规定要求	选通(A): $2.0 \pm 0.2$ 微秒 选通(B): $3.8 \pm 0.1$ 微秒

1. 向录象机视频输入插座插入SECAM制式彩条信号。选择A/V频道，设录象机于A/V工作状态。
2. 接双轨迹示波器于录象机CH-1的TP5304(色度信号)和TP5301(接地)以及CH-2的TP5303(水平同步信号)和TP5301(接地)，使色度信号输出与图2-14的所示一致。
3. 设录象机于SP走带方式的记录工作状态。(非LP方式)

4. 调节R5310(同步选通调整A)和R5311(同步选通调整B), 使TP5304(色度信号)输出波形与TP5303(水平同步信号)输出波形间的间隔A、B相互影响。

注:

TP5304(色度信号)、TP5303(水平同步信号)、TP5301(接地)、R5310(同步选通调整A)以及R5311(同步选通调整B)位于SECAM制式色度信号电路模块上。

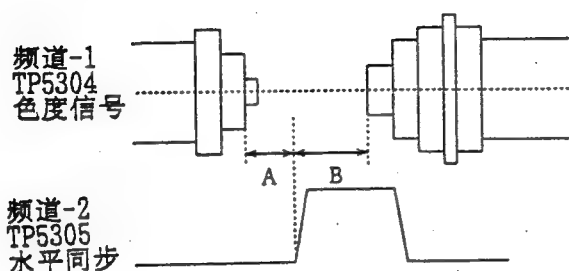


图2-14

再现均衡器的调整

(仅限于VC-H91/H91ETS两型号)

检测仪器	示波器
工作状态	再现
使用磁带	校正用磁带(VROCSSV)
测试点	TP5304(信号)、TP5301(接地)
调整点	FL5303(1.1MHz再现贝尔滤波器)
规定要求	——

1. 接示波器于TP5304(信号)及TP5301(接地)。
2. 再现校正用磁带(VROCSSV)录有SECAM制式彩条的部分。
3. 调节FL5303(1.1MHz再现贝尔滤波器), 使红色与蓝色的平坦部分重合, 达至图2-15的所示要求。

注:

TP5304(信号)、TP5301(接地)以及FL5303(1.1MHz再现贝尔滤波器)位于SECAM制式色度电路信号模块之上。

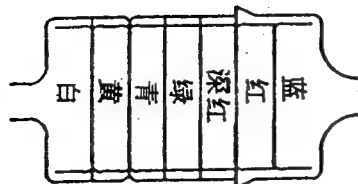


图2-15

SECAM制式记录电流的调整

(仅限于VC-H91/H91ETS两型号)

检测仪器	示波器
工作状态	记录(SP方式)
输入信号	EBU标准SECAM制式彩条信号(1.0Vp-p)
测试点	TP301(信号)、TP302(接地)
调整点	R5348(记录色度调整)
规定要求	$23 \pm 1\text{mVp-p}$ (LP方式时)

1. 向录象机视频输入插座输入SECAM制式彩条信号。选择A/V频道, 设录象机于A/V工作状态。
2. 接示波器于TP301(信号)和TP302(接地)。TP301(信号)及TP302(接地)位于前置放大器电路模块之上。
3. 设录象机于SP或LP走带方式的记录工作状态。
4. 用一只 $47\mu\text{F}/16\text{V}$ 电解电容器短接TP203和接地, 使FM调频亮度信号达至最小。
5. 调节R5348(记录色度调整), 使青色部分的幅值达至如图2-16所示的 $23 \pm 1\text{mVp-p}$ 之规定要求(LP方式时)。

注:

R5348(记录色度调整)位于SECAM制式色度信号电路模块之上。

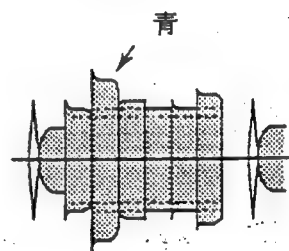


图2-16

- SECAM制式色度信号电路模块各调整点及测试点的位置公布

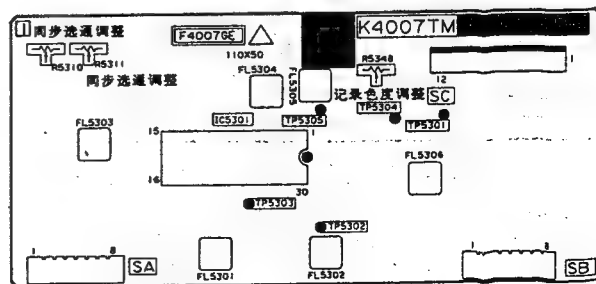


图2-17

## NTSC制式变换至PAL制式/ AI/IF电流的调试

NTSC制式→PAL制式信号变换电路的调试

检测仪器	计频器
工作状态	再现
带盒	校正用磁带 (VROATSV)
测试点	TP5502 (SIG, 信号端) TP5501 (GND, 接地端)
调整点	R5557 (VCO调节)
规定要求	15735±20Hz

1. 再现校正磁带 (VROATSV), 设彩色方式选择开关于“**AUTO**”位置。
2. 用一根两头带夹的引线短接TP5504 (IC5501的销15)和TP5503 (PC5V)。
3. 把计频器接到测试点TP5502 (信号)和TP5501 (接地)上。  
调节R5557, 使计频器上的读数达至15735±20Hz的规定要求。  
(然而, 于上述的步骤2, 自激状态发生时, 产生±30Hz的牵引频率。)
4. 拆去短接TP5502和TP5503间的引线, 检查PAL制式时彩色图象是否正常呈现。(通过PAL制式彩色电视机或带有PAL制式的多制式彩色电视机观察之。)

图象自动控制的调试

检测仪器	直流伏特计
工作状态	以SP方式录象和再现自录磁带 (色制: PAL)
输入信号	EBU标准彩条信号
测试点	TP2301 (SIG, 信号端) TP2302 (GND, 接地端)
调整点	R2357 (图象控制调节)
规定要求	2.6±0.1VDC

1. 确认Y/C录象电流 (R208, R504) 的调试已符合规定要求。
2. 设图象自动控制选择开关于“**ON**”或“**AUTO PICTURE**”之位置。并设图象色调调节于中间位置。
3. 把直流伏特计接在测试点TP2301 (+)和TP2302 (-)上, 调节R2357, 使直流伏特计上的读数达至直流2.6±0.1V。

## NTSC制式变形的调整

NTSC制式变形补偿的调整

检测仪器	双轨迹示波器及电视机监视器
工作状态	再现 (SP方式静止动作)
使用磁带	校正用磁带 (VROATSV)
测试点	CH-1: TP2202 (磁头开关脉冲) CH-2: 视频输出端
调整点	R4411 (NTSC制式变形的调整)
规定要求	电视机监视器荧屏上无晃抖

1. 装入校正用磁带 (VROATSV), 再现之 (SP方式静止动作状态)。
  2. 接双轨迹示波器的CH-1于TP2202 (磁头开关脉冲)、CH-2于视频输出端。
  3. 通过示波器观察TP2202 (磁头开关脉冲) 及视频输出端的输出波形。
  4. 调节R4411 (NTSC制式变形调整), 使CH-1输出 (磁头开关脉冲的高电平) 与CH-2输出 (磁头开关脉冲的低电平) 之间的电平差达至±0.1V。
  5. 如电视机监视器荧屏上的色彩晃抖较明显, 微调R4411, 使荧屏上的晃抖程度达至最小程度。
- 注: TP2202 (磁头开关脉冲) 和R4411 (NTSC制式变形调整) 位于主电路模块之上。

● 主电路模块各调整点及测试点的位置公布

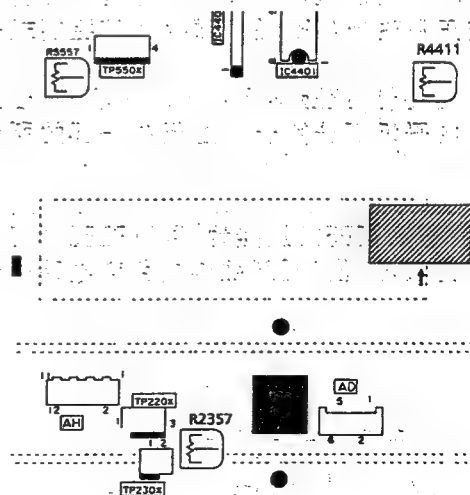


图2-18

## 在屏表示电路的调整

在屏表示自动频率控制的调试

检测仪器	计频器
工作状态	蓝色背景
测试点	TP5901(信号), TP5903(接地)
调整点	R5912, 自动频率控制
规定要求	$15.625 \pm 0.2\text{kHz}$

1. 接计频器于位于终端电路印刷电路板上的 TP5901(信号)和 TP5903(接地)之间。
2. 触按遥控器上的在屏表示键, 让字符表示于电视屏幕。
3. 通过一只  $1\text{k}\Omega$  电阻向 TP5902 加直流 5V 电压。(或设录象机于无接收设定的 TV 频道)。
4. 调节 R5912, 使计频器上的读数达至 15.625 的规定要求。
5. 拆去  $1\text{k}\Omega$  电阻 (或设录象机于有内容设定的 TV 频道), 检查表示于电视屏幕 (非蓝色背景状态) 上的字符, 是否有晃抖、歪斜现象。

在屏表示水平尺寸的调试

检测仪器	示波器和监视电视机
工作状态	在屏表示
测试点	视频输出插座
调整点	C5901, 文字表示位置控制
规定要求	$56 \pm 1$ 微秒

1. 接示波器于视频输出插座。
2. 触按遥控器上的在屏表示键, 让字符表示于电视屏幕。
3. 调节 C5901, 使水平同步与字符脉冲间的时间达至如图 2-19 所示的 56 微秒的规定要求。
4. 检查在屏表示字符的表示位置是否位于电视屏幕之左侧或右侧位置过远。

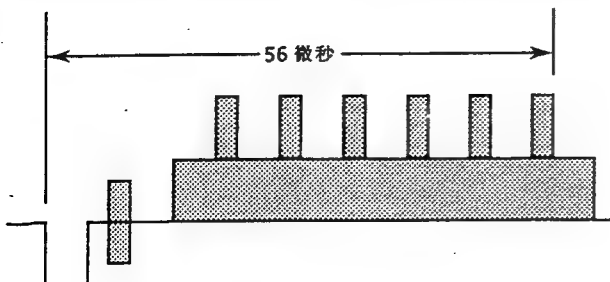


图 2-19

## ● 终端电路模块各调整点和测试点的位置分布

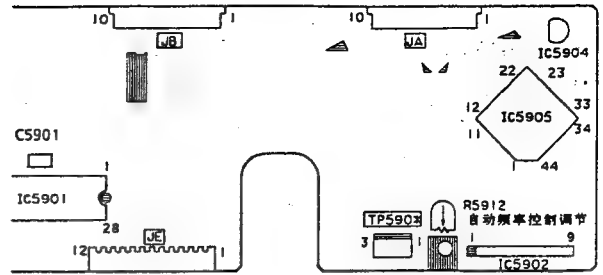


图 2-20

## A F T 电路的调试

检测仪器	示波器 甚高频频带调幅信号发生器
工作状态	正常地接收电视台节目信号
输入信号	PIF 频率单频信号
测试点	IC1501 销(8)(视频输出信号) IC1501 销(5)(接地) 位于调谐器/中频包 电路模块上
调整点	AFT 线圈控制
规定要求	-----

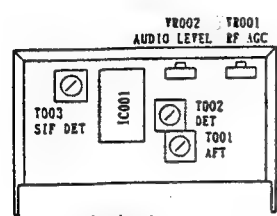
1. 要让录象机正常地接收电视台节目信号。(输入磁场强度: 天线端的  $70\text{dB}\mu\text{V}$ )
2. 使用甚高频带调幅信号发生器, 向调谐器中频输出端输入 PIF 频率 (38.9 兆赫) 信号 (正弦波)。
3. 接示波器于 IC1501 销(8)(视频输出信号)和 IC1501 销(5)(接地)之间。
4. 将调谐开关或按钮设于 VHF 或 UHF 位置, 触按调谐键的 (+) 或 (-), 直到所需的电视台频道节目清晰地出现在电视机上, 以及将示波器屏幕上表现出来的差拍调至到最小。  
将频道设定开关或按钮设于设定位置上。
5. 旋转自动微调线圈芯, 使示波器屏幕上显示的拍频达至最小程度。(自动微调线圈位于中频包装置之上)。

VC-H91/H91ETS  
VC-H96/H96ETS  
VC-H980/H980ETS

PIF频率表

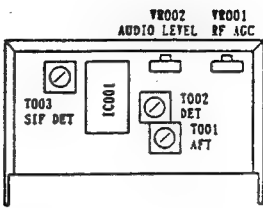
型 式	频率
VC-H91/H91ETS VC-H96/H96ETS VC-H980/H980ETS	38.9MHz

图 2-21



中频包

图2-22



中频包

图2-23

射频自动增益控制(RF AGC)电路的调试

检测仪器	示波器
工作状态	正常地接收电视台节目信号 分裂场形条信号
测试点	IC1501销(8)(视频输出信号) IC1501销(5)(接地) 位于调谐器/中频包 电路模块上
调整点	VR001自动增益控制
规定要求	收缩前瞬间(参阅图2-23)

音频电平的调整

检测仪器	交流毫伏计
输入信号	射频信号(话音信号1kHz±50Hz 偏差,调制因数100%)
测试点	Q1509的发射极、接地端(位于 调谐器/中频装置电路模块之上)
调整点	VR002(音频电平控制)
规定要求	-13±2dBs

- 1.接收天线端传来的最清楚的射频信号。
- 2.接交流毫伏计于Q1509的发射极和接地端。
- 3.调节VR002(音频电平控制),使交流毫伏计上的读数达至-13dBs的规定要求。

●调谐器/中频包电路模块各调整点及测试点的位置分布

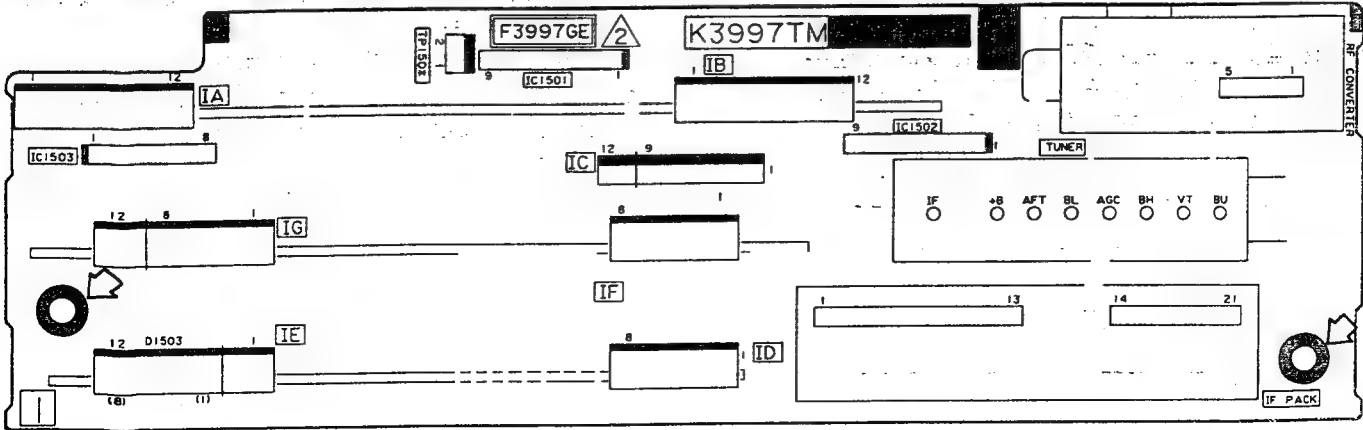


图 2-24

## NICAM电路的调整

### NICAM检波电路的调整

(仅限VC-H96/H96ETS/H980/H980ETS四型号)

检测仪器	双轨迹示波器
输入信号	接收图象清楚的电视节目(射频NICAM信号)
工作状态	E-E(B/G, I或双重方式)
测试点	TP1703(CH-B)、TP1702(CH-A) TP1701(接地)
调整点	T1601(网眼图案控制)(位于 SIF/MPX电路模块之上)
规定要求	见图2-25

1. 让录像机接收图象清楚的电视节目。检查电视机监视器荧幕上的图象、色彩是否清晰、有无晃抖现象。
2. 接X-Y方式的双轨迹示波器于TP1703(CH-B)和TP1701(接地)以及TP1702(CH-A)和TP1701(接地)。
3. 通过X-Y方式接续, 观察示波器上呈现的输出波形。
4. 调节T1601(网眼图案控制), 消除双轨迹示波器荧屏上呈现的噪声影响。

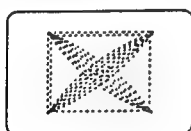
注意: 信噪比并非为最佳之场合

#### ① 设定于B/G方式时

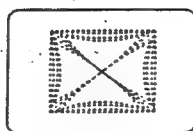
调节SIF/MPX调制的T1601(网眼图案控制), 直至示波器显示出的重叠圆形部分转移至中心位置为止。

#### ② 设定于I方式时

调节SIF/MPX调制的T1601(网眼图案控制), 直至示波器显示出的交叉线条部分为最小, 并使之转移至中心位置为止。



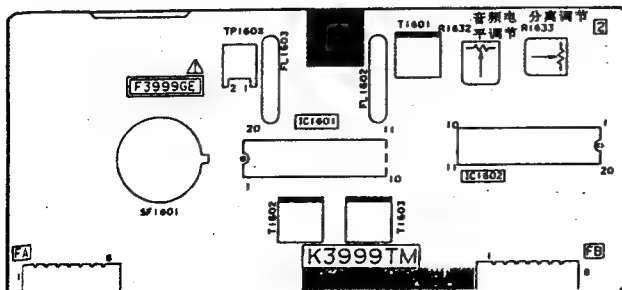
B/G方式时的  
网眼图案



I方式时的  
网眼图案

图2-25

### ● SIF/MPX电路各调整点及测试点的位置分布





## Hi-Fi音频电路的调整

调整Hi-Fi音频电路的注意事项

1. Hi-Fi音频电路可以不用电位器而用固定电阻器。因此,调整Hi-Fi音频电路时,需要用微调电阻器暂时代替这些固定电阻器,其要领如图2-29所示。  
所用微调电阻器的零件代码表示于每个调整过程表中。

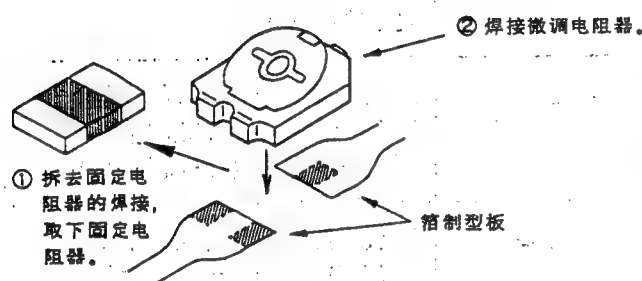


图2-29

2. 每项调整的步骤均以左声道为其准叙述。右声道的调整可以此类推。  
记于括号“[ ]”中的零件代码,数值是右声道调整叙述之简化。

3. Hi-Fi音频电路模块的功用

- 1) 记录工作状态

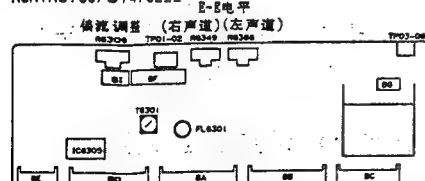
记录电视节目的立体声信号以及为其作控制调节

- 2) 再现工作状态

播放磁带录音以及为其作控制调节(无Hi-Fi音响时,触按(+)或(-)按键,调节跟踪,使显示器上“L”(左声道)和“R”(右声道)的字样亮启,并消去磁头开关噪声的影响。)

### ● Hi-Fi音频电路模块各调整点及测试点的位置分布

RUNTK0733/O747GEZZ



## 音频磁头转换点的检查

检测仪器	双轨迹示波器
工作状态	再现
使用磁带	校正用磁带 (VROCBFFS)
测试点	TP6305(信号)、TP6306(接地) (音频磁头开关脉冲)
	TP6303(信号)、TP6306(接地) 再现包络线)
规定要求	大于100微秒

1. 双轨迹示波器于TP6305 (信号) 和TP6306 (接地) (音频磁头开关脉冲) 以及TP6303 (信号)和TP6306 (接地) (再现包络线)。
2. 再现校正用磁带 (VROCBFFS)。
3. 通过示波器、观察音频磁头开关脉冲的上升边缘以及下降边缘的时序波形。
4. 检查TP6303 (信号) 和TP6306 (接地) 的包络线是否如图2-31所示, 满足较音频磁头开关脉冲两边缘大100 微秒之规定要求。如果要求不能达至满足, 则需重新进行“磁头转换点的调整”(见“伺服电路的调整) 以及走带状况之检测。

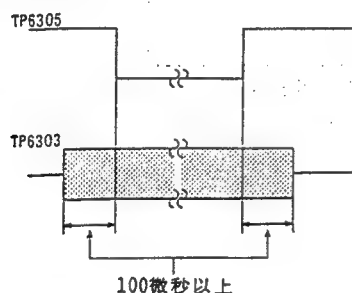


图2-31

## 线性音频再现电平的调试

检测仪器	交流毫伏特计
工作状态	再现
输入信号	校正用磁带 (VROCPSV) (1kHz电平控制信号)
测试点	音频输出插座
规定要求	$-12 \pm 2\text{dBs}$ (于RCA插座)

1. 再生校正磁带 (VROCPSV) 1 千赫电平控制信号。
2. 把交流毫伏特计接到音频输出插座上。
3. 使其输出电平达至 $-12 \pm 2\text{dBs}$  (于RCA) 的规定要求。

## 线性音频偏流的调试

检测仪器	交流毫伏特计
工作状态	录象 (PAL制)
输入信号	无特别要求
测试点	TP6301 (+) ~ TP6302 (-)
调整点	R6306 偏压电流
规定要求	$2.2 \pm 0.1\text{mVrms}$

1. 把交流毫伏特计接到测试点TP6301(+)和TP6302(-)上。(用TP6302当作接地引线。)
2. 设录象机于录象状态。
3. 调节R6306, 使偏压电流值调至 $2.2 \pm 0.1\text{mVrms}$  微安的规定要求。
4. 记录、再现电视播放内容, 检查再现声音是否嘈杂。

## 线性音频偏漏的检查

检测仪器	交流毫伏电压计或示波器
工作状态	记录
输入信号	无必要
测试点	音频输出插座
调整点	——
规定要求	小于 $-20\text{dBs}$ 或 $220\text{mVp-p}$

1. 设录象机于记录状态, 并用“AV”(音影) 频道接收A/V(音频/视频)信号。注意避免向音频输入插座输入任何信号。
2. 接交流毫伏电压计或示波器于音频输出插座。
3. 检查偏漏是否符合低于 $-20\text{dBs}$ 或 $220\text{mVp-p}$  的规定要求。

## 消磁电压和振荡器频率的检测

检测仪器	示波器
工作状态	录象
测试点	完全消磁磁头
调整点	T6301偏压振荡器变频器
规定要求	$70 \pm 10\text{kHz}$ , $40\text{Vp-p}$ 或大于

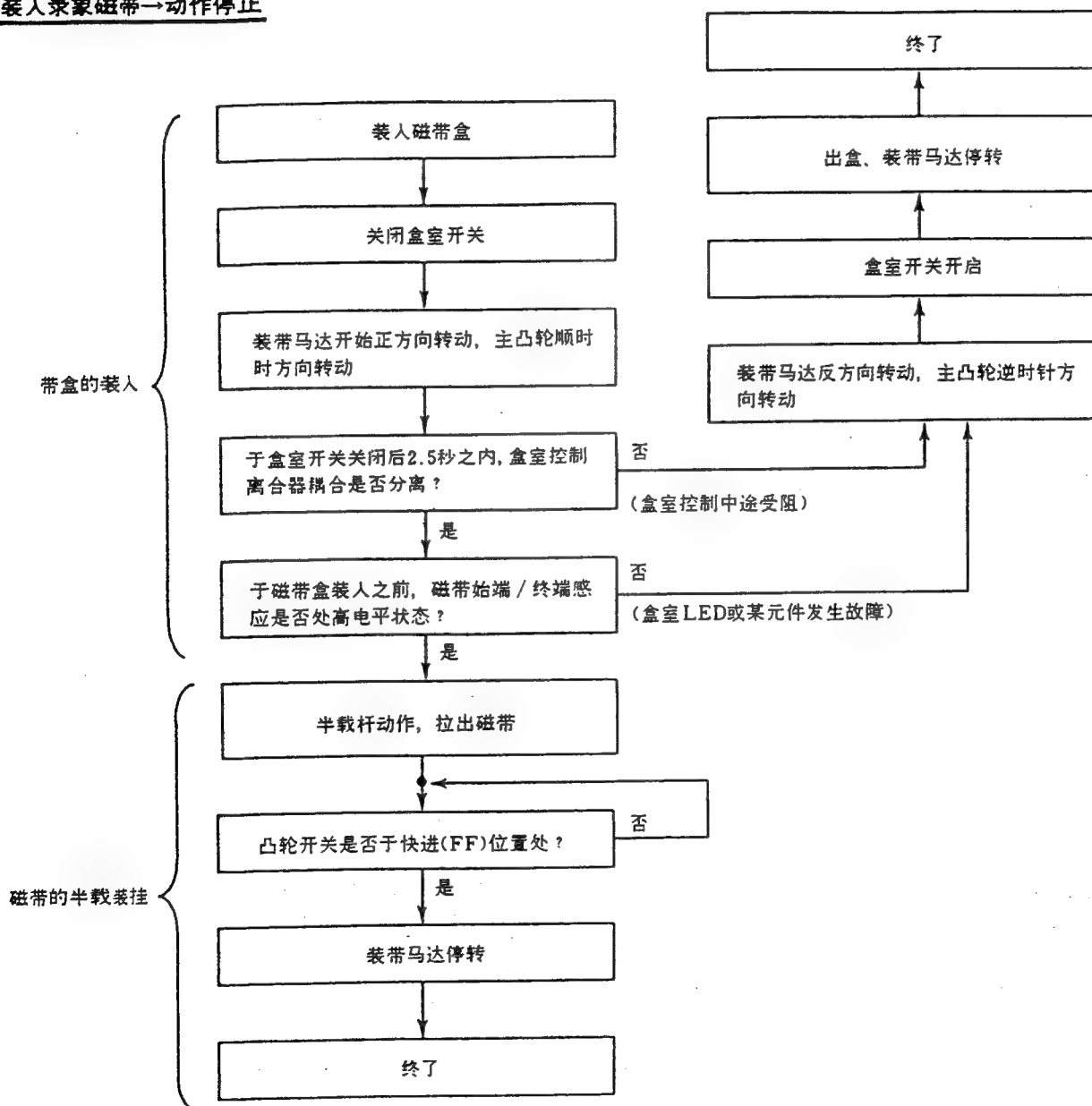
1. 设录象机处于录象状态。
2. 把完全消磁磁头跨接到示波器上。  
“ (白色: 信号端, 灰色: 接地端) ” 为正确。
3. 确认跨接于完全消磁磁头的消磁电压近似或大于 $40\text{Vp-p}$ , 以及频率为 $70 \pm 10\text{kHz}$ 。

## 录象机机械动作流程图及机械故障检查

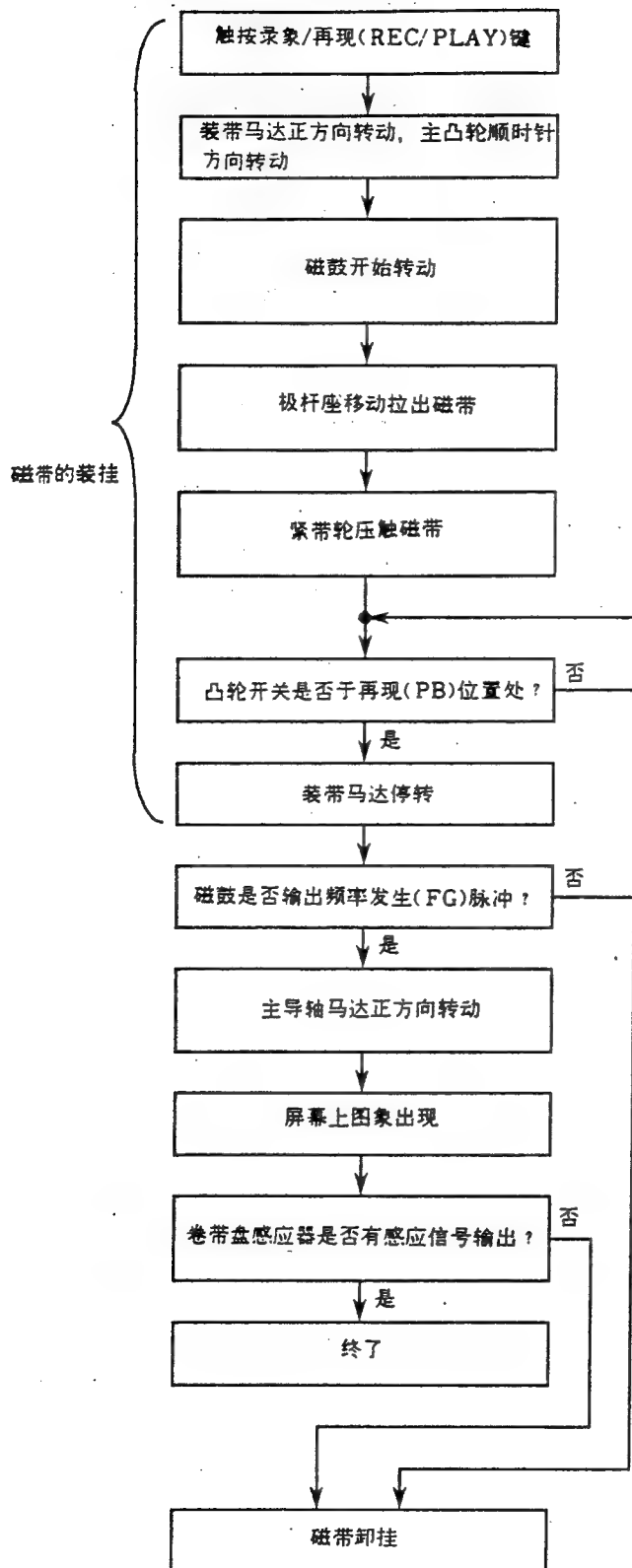
### 录象机机械动作流程图

\*该流程图意在说明录象机机械动作的大致概要，而不对其作详细具体的说明。  
\*关于凸轮开关位置，请见图3-2所示。

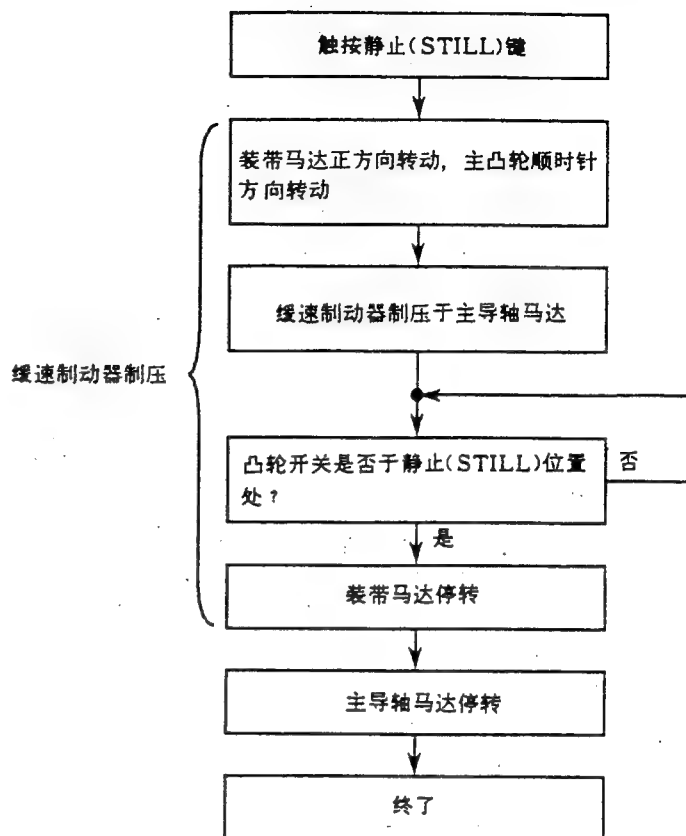
#### 装入录象磁带→动作停止



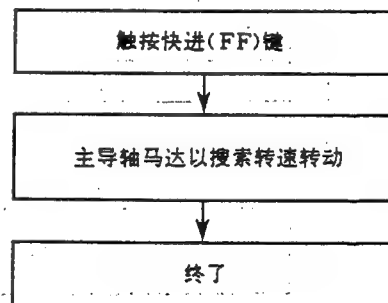
停止状态→录象/再现



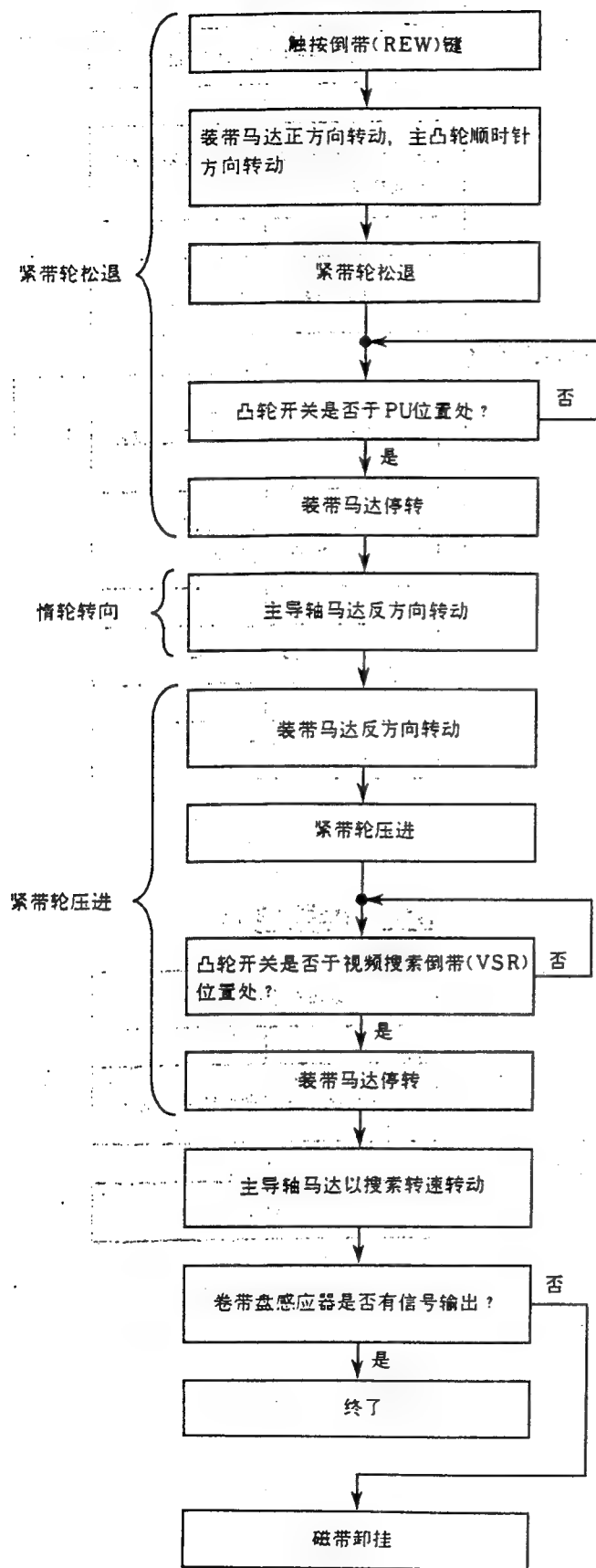
再现状态→静止



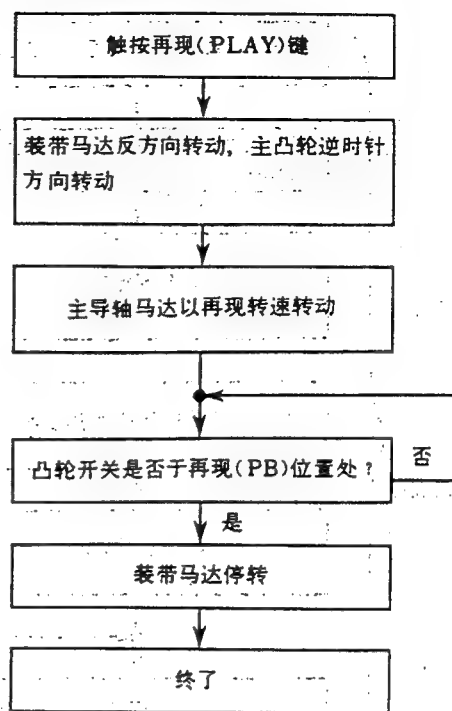
再现→视频搜索快进



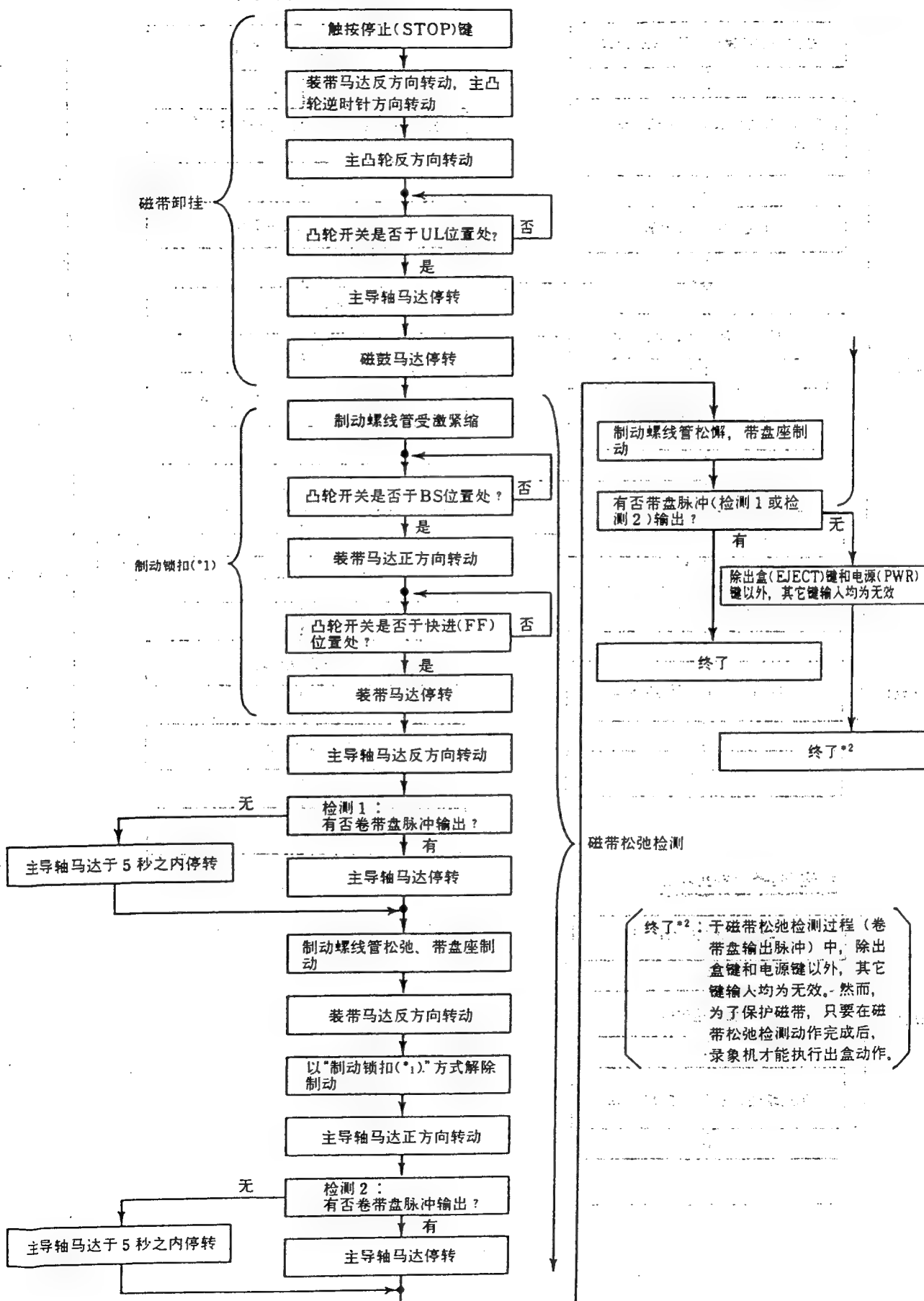
### 再现→视频搜索倒带



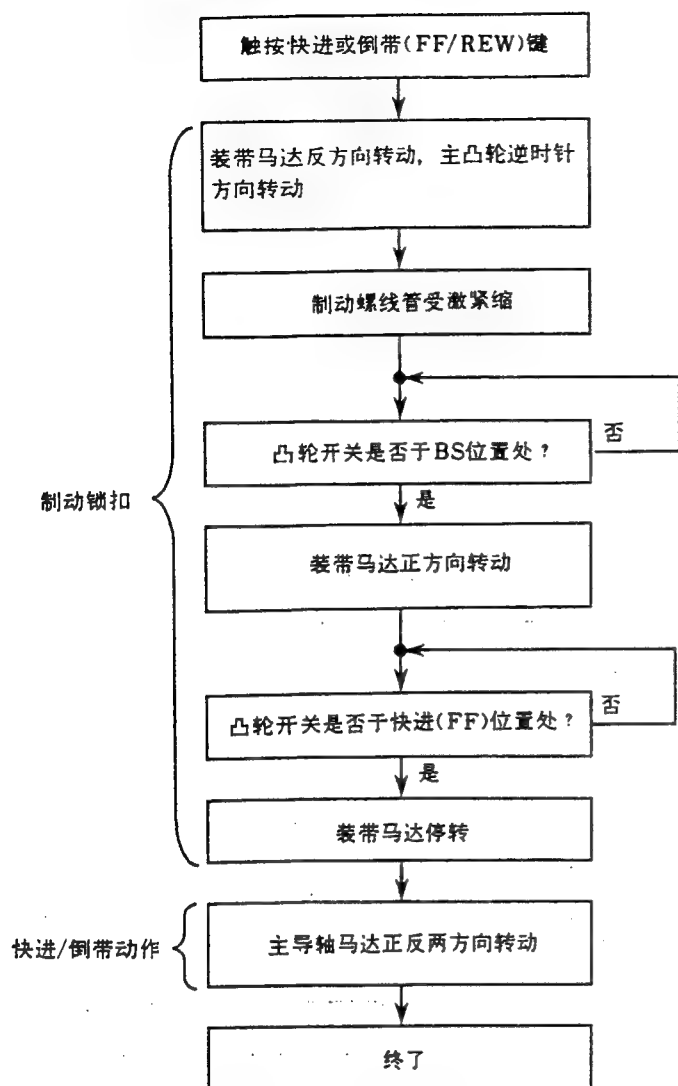
### 视频搜索倒带→再现



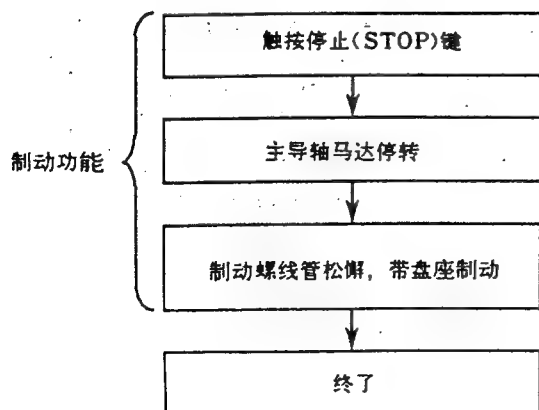
# 录象/再现→停止状态



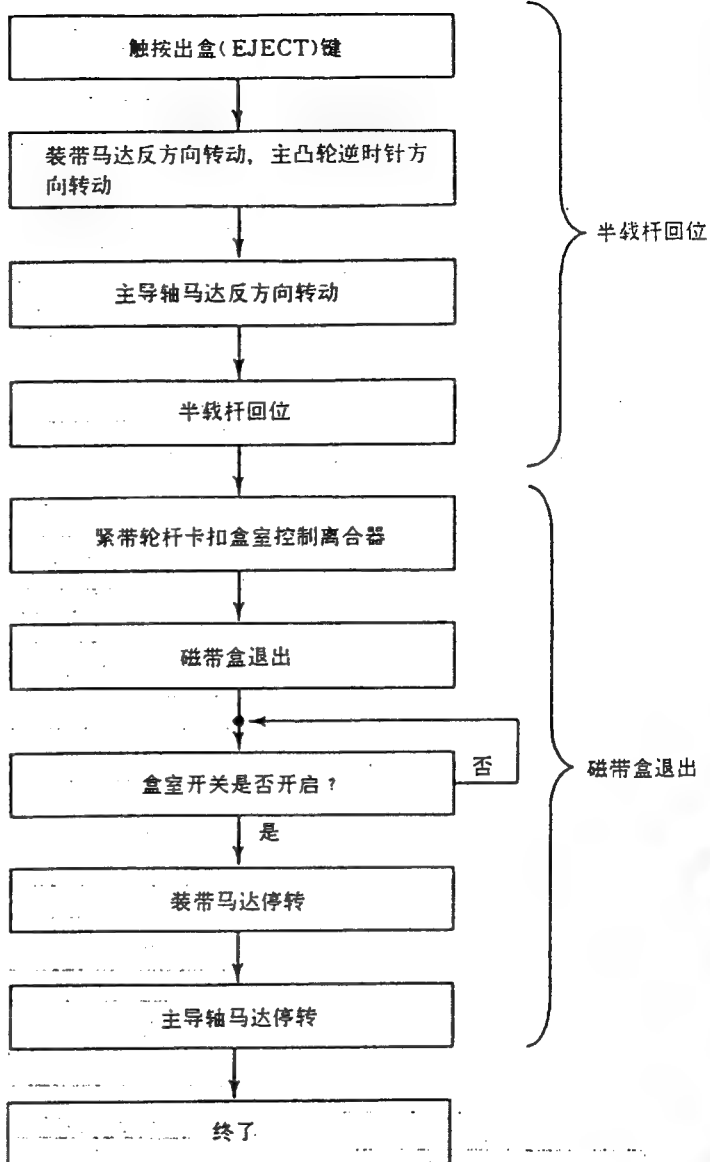
### 停止状态→快进/倒带



### 快进/倒带→停止状态



### 停止状态→出盒



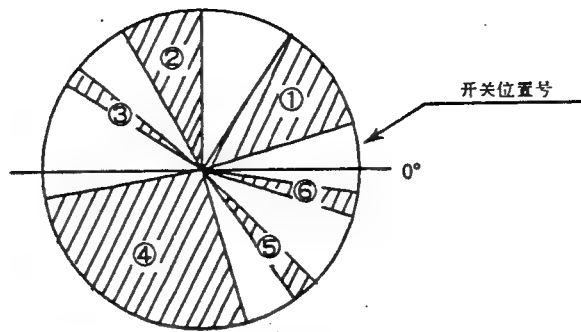


图3-1 凸轮开关图

\* 凸轮开关位置图如图3-1所示。当信号进入图中阴影区域，其电路便开始运转。这时，系统控制器对凸轮开关的六个接续端的开闭进行判定检查，以决定录像机的工作状态。

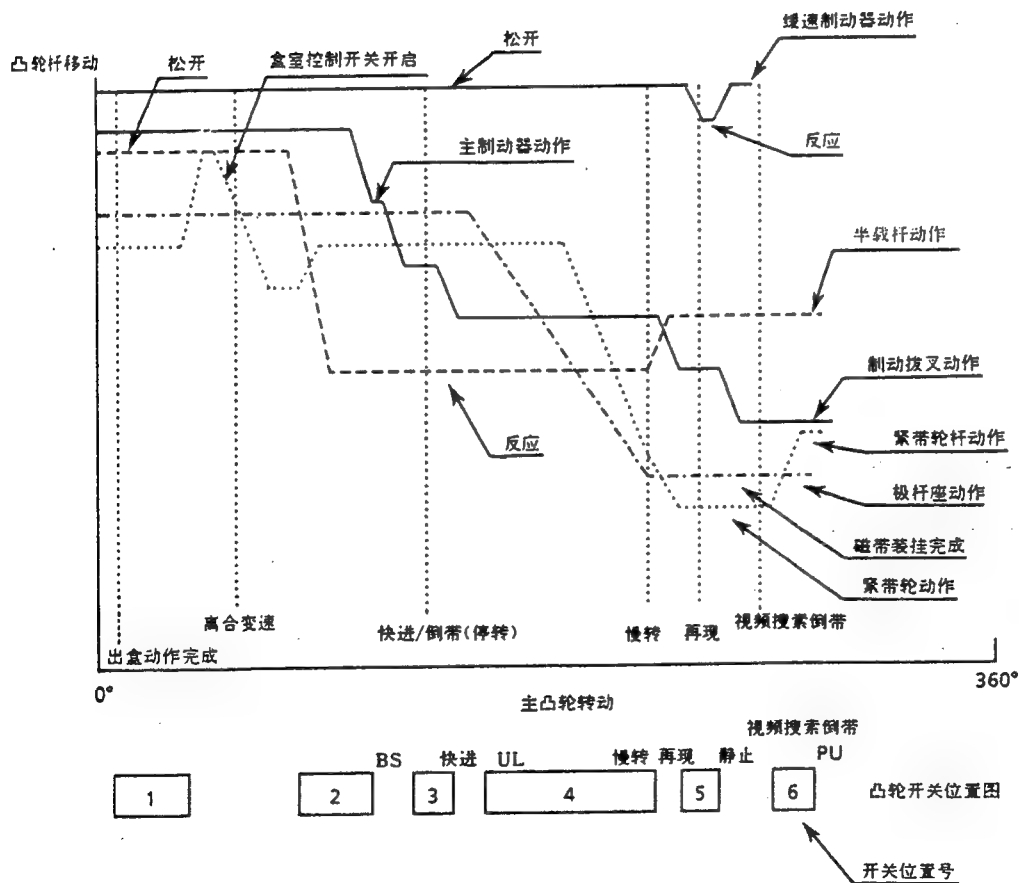


图3-2 凸轮开关位置与机械动作间的关系

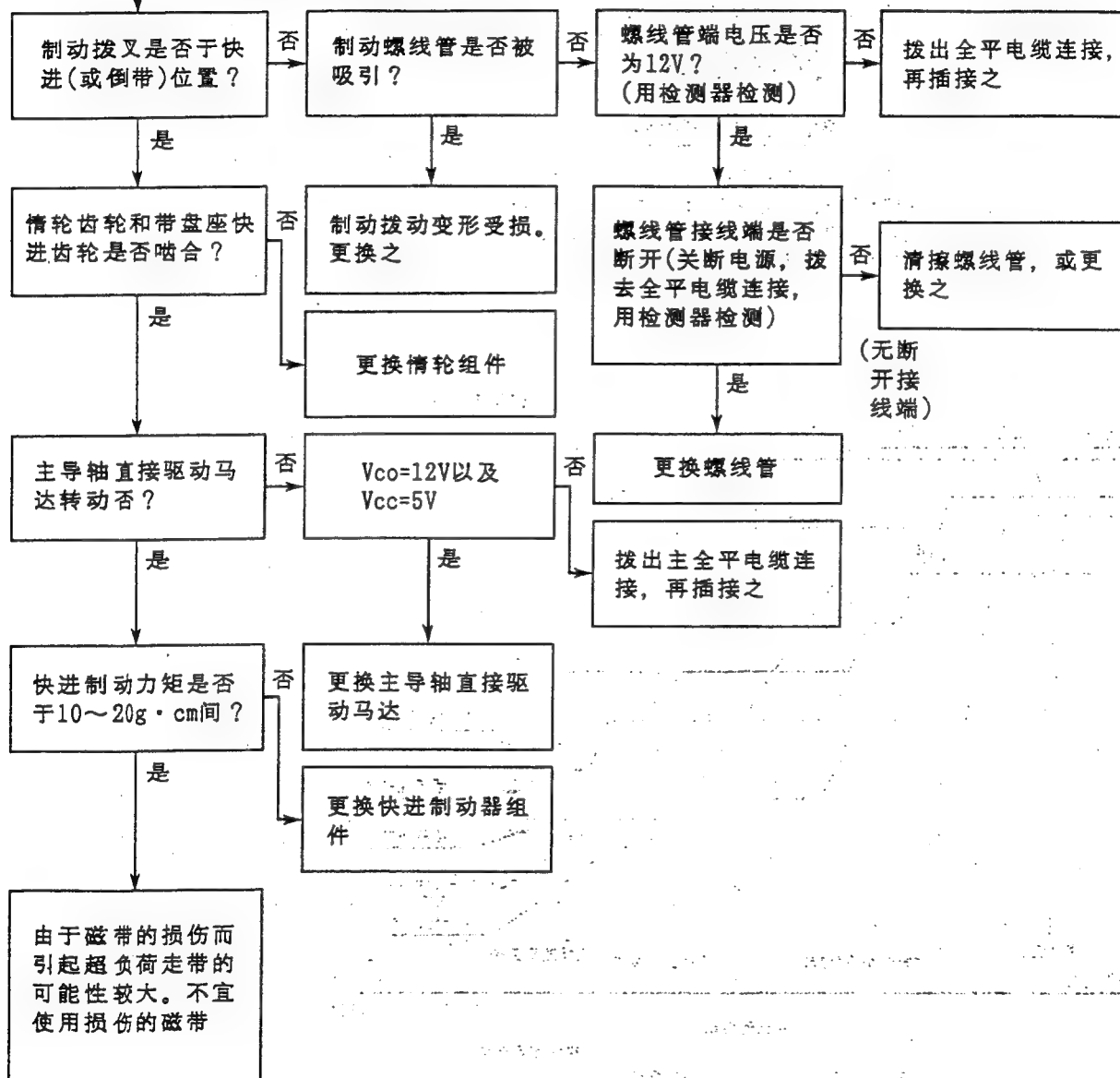
凸轮开关位置与录像机机械动作间的对应关系如图3-2所示。



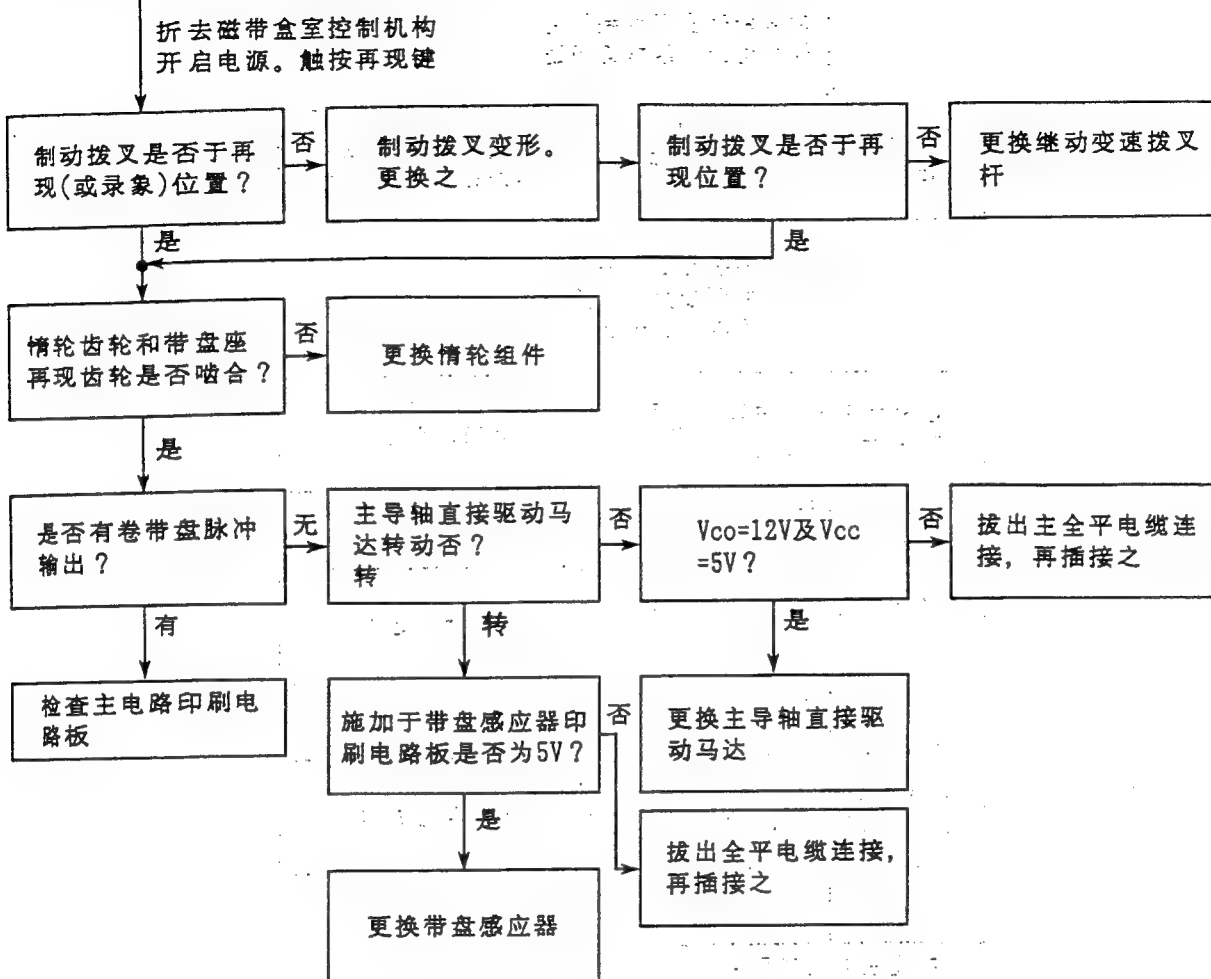
# 机械故障检查

## 1. 快进 / 倒带不动作 (不卷带)

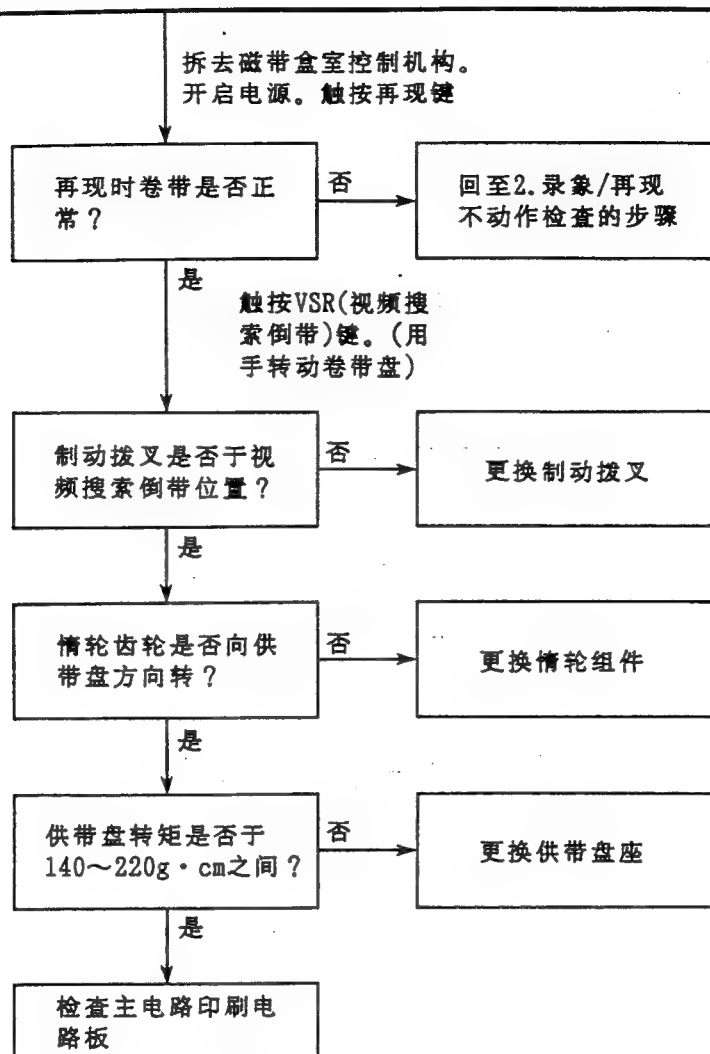
折去磁带盒室控制机构  
开启电源。触按快进键



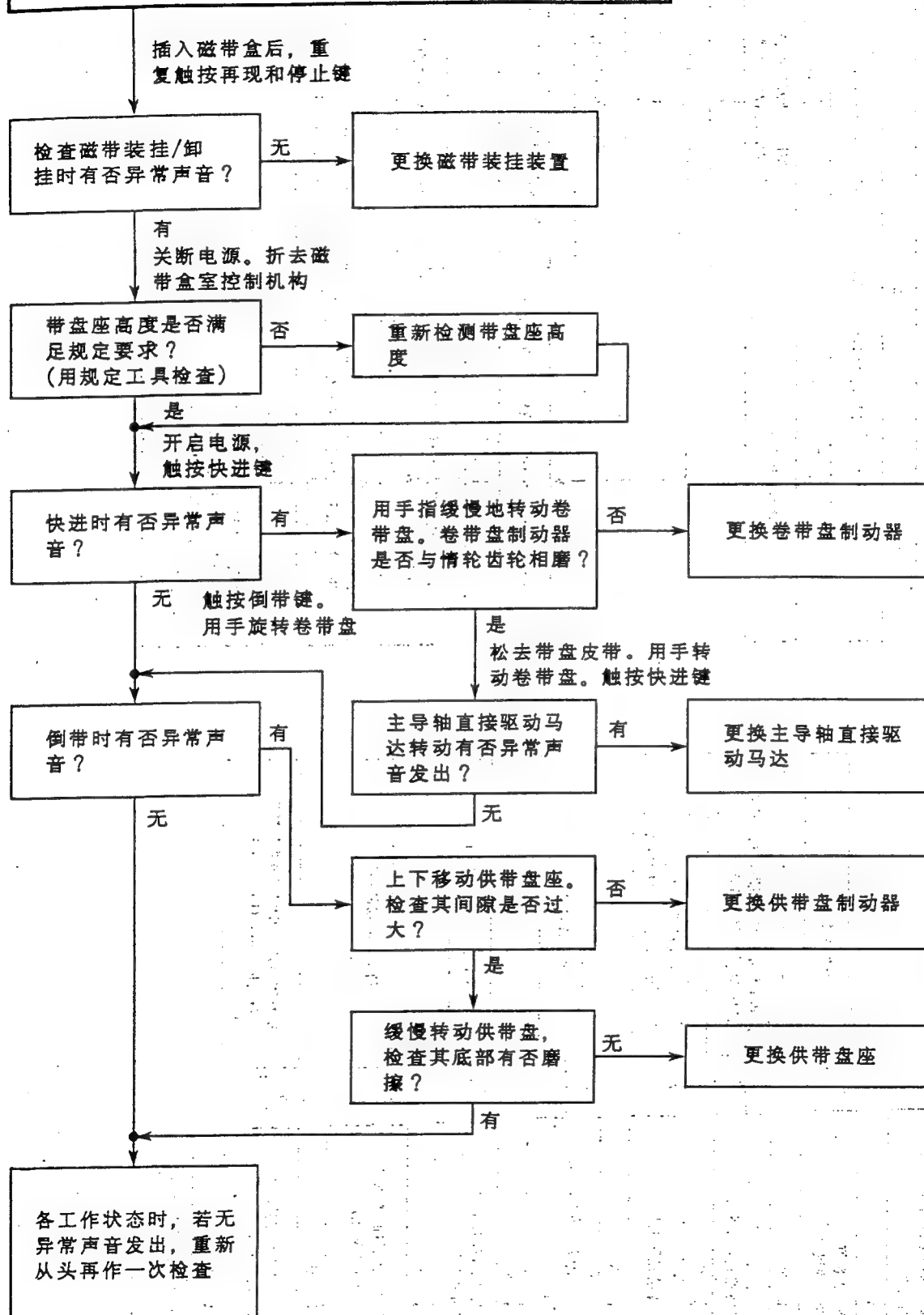
## 2. 录象 / 再现不动作 (状态解除)



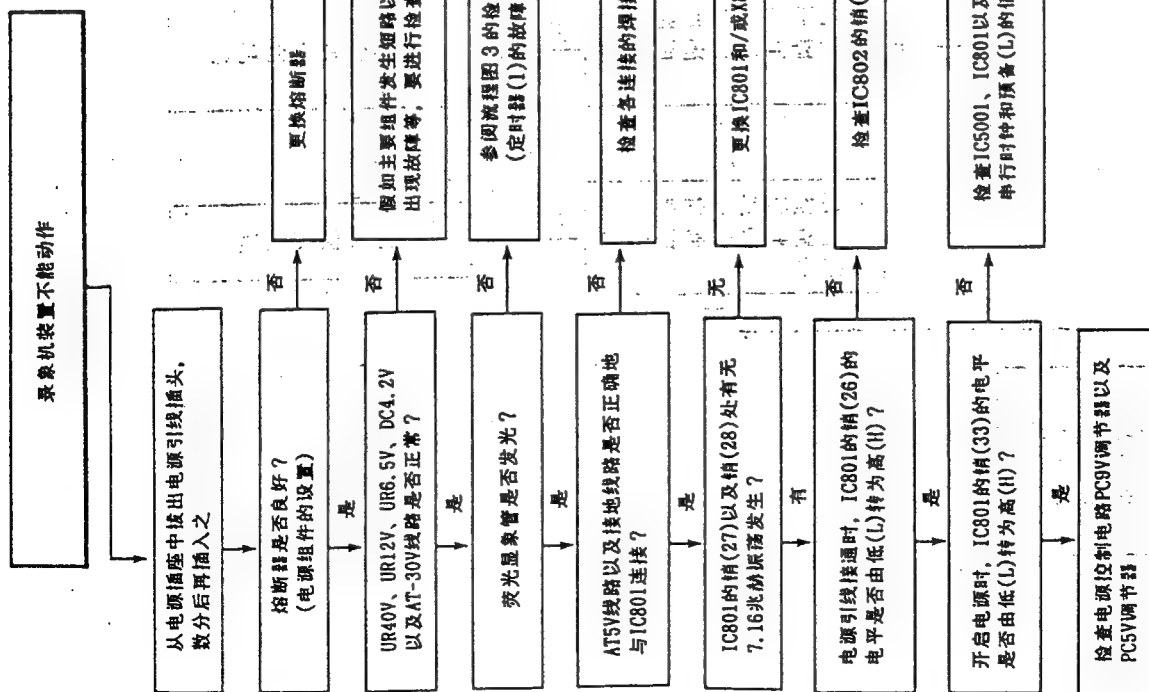
### 3. 视频搜索倒带不动作 (不卷带)



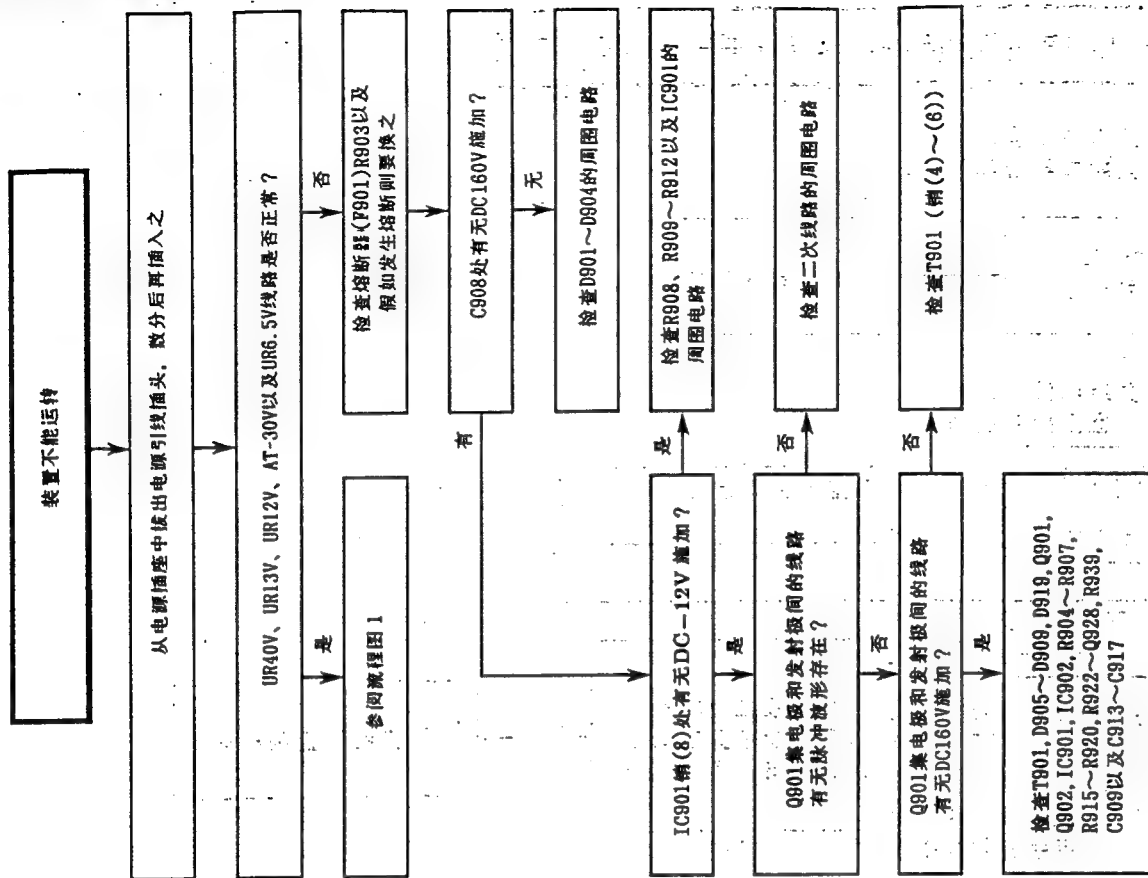
#### 4. 于各工作状态均发出异常声音



流程图 1 电源电路的故障检查

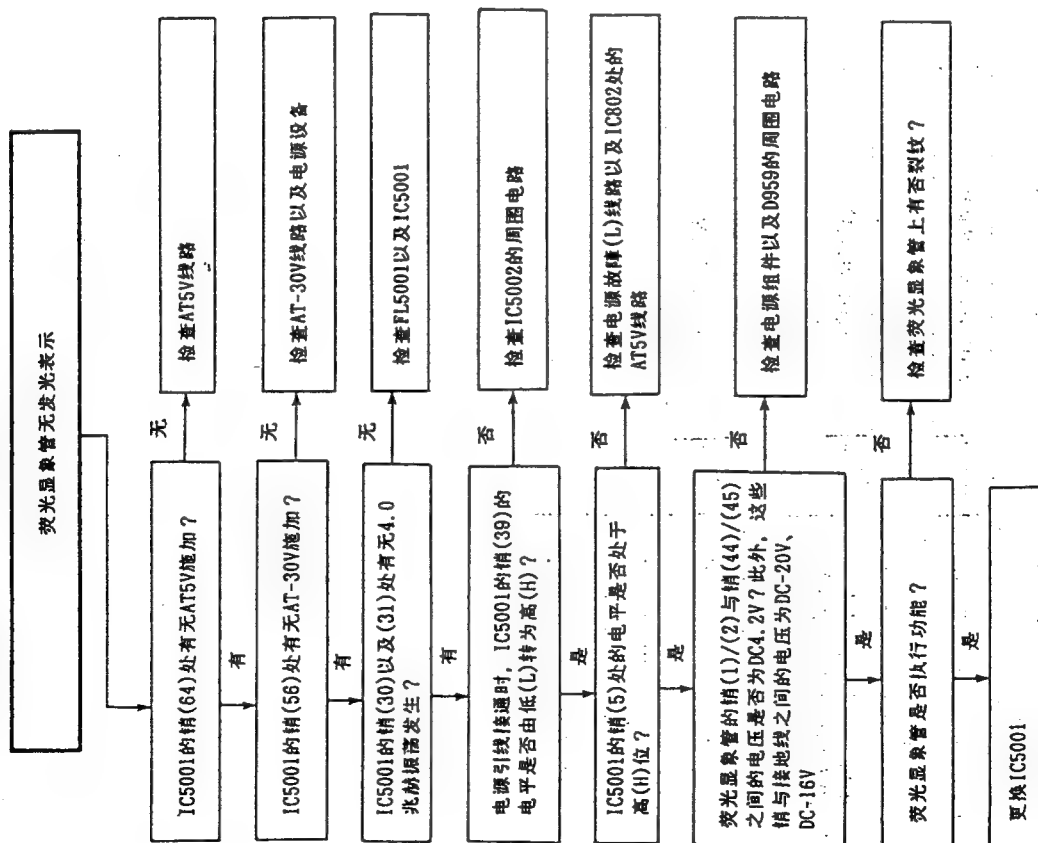


流程图 2 电源组件的故障检查

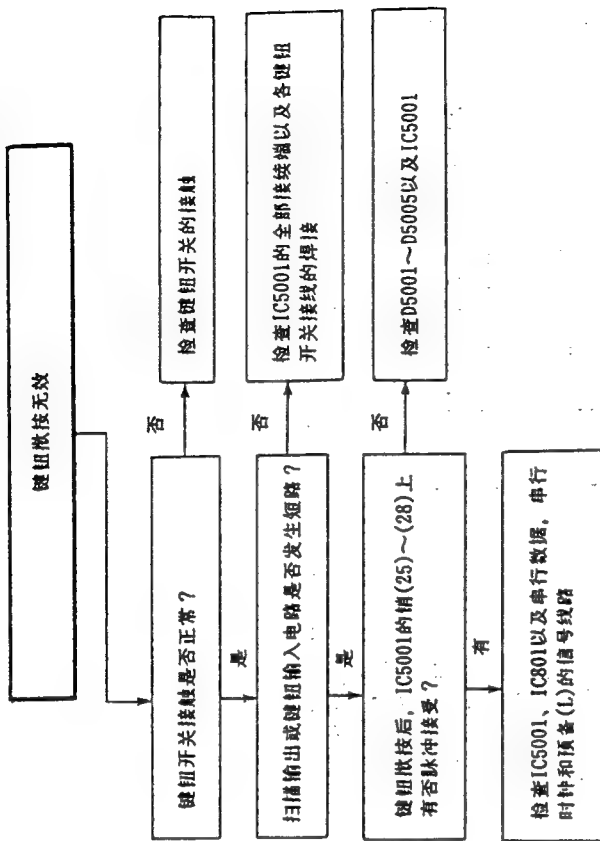


H91/H91ETS  
H96/H96ETS  
H980/H980ETS

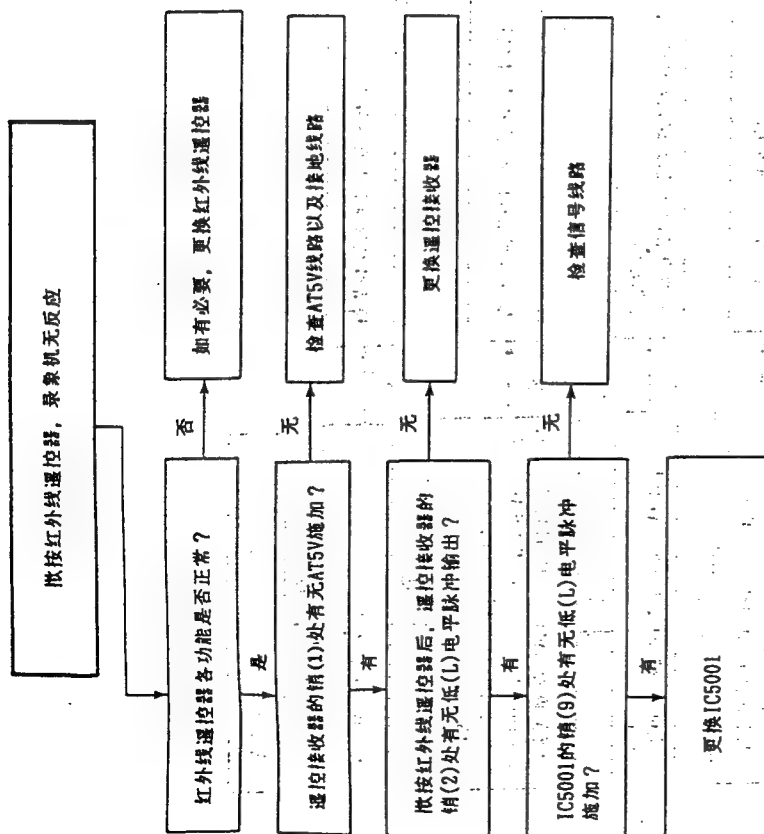
流程图 3 定时器(1)的故障检查



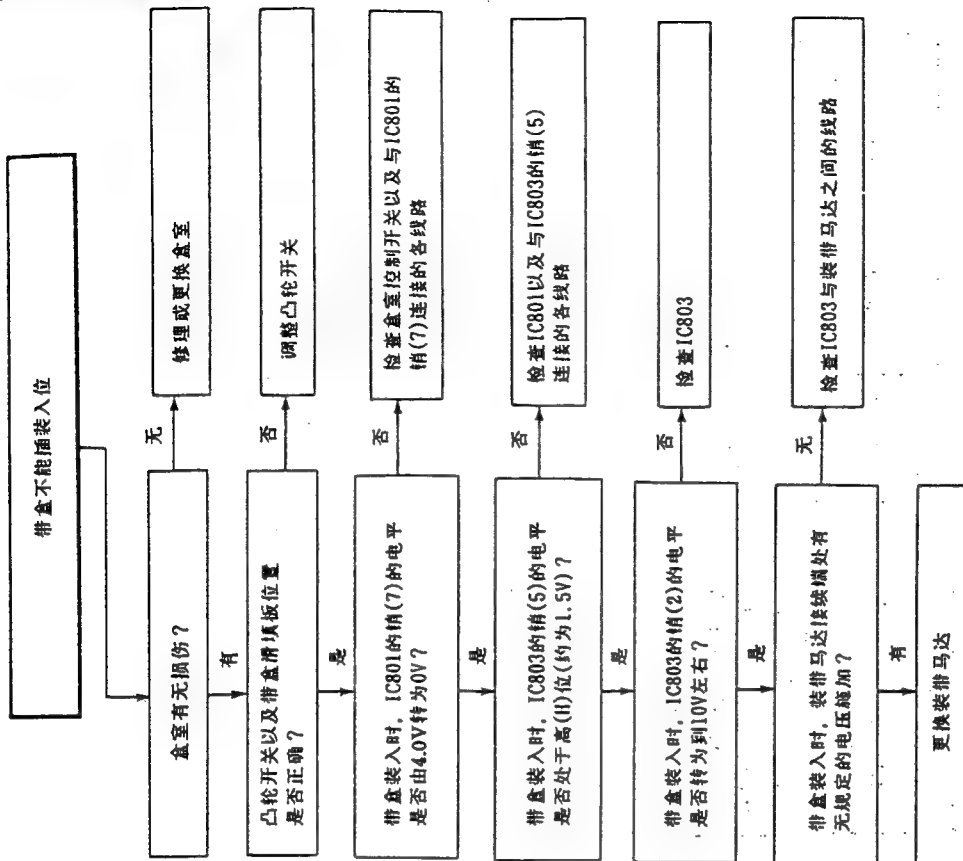
流程图 4 定时器(2)的故障检查



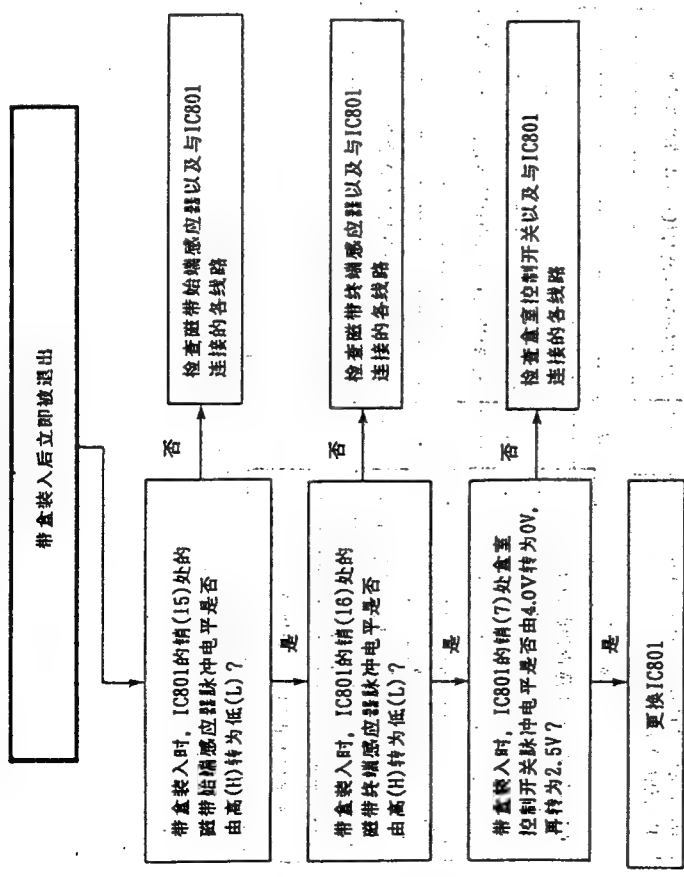
流程图 5 红外线遥控器的故障检查



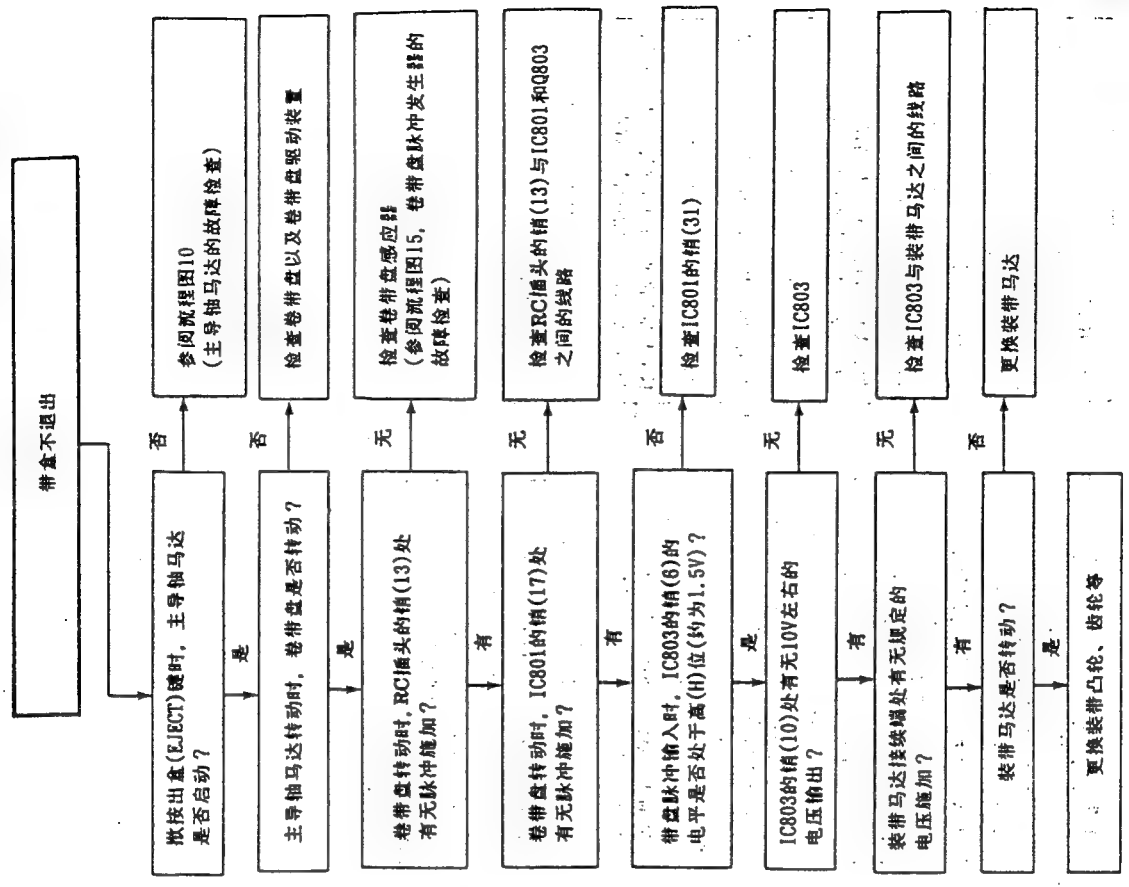
流程图 6 磁带盒室控制机构的故障检查(1)



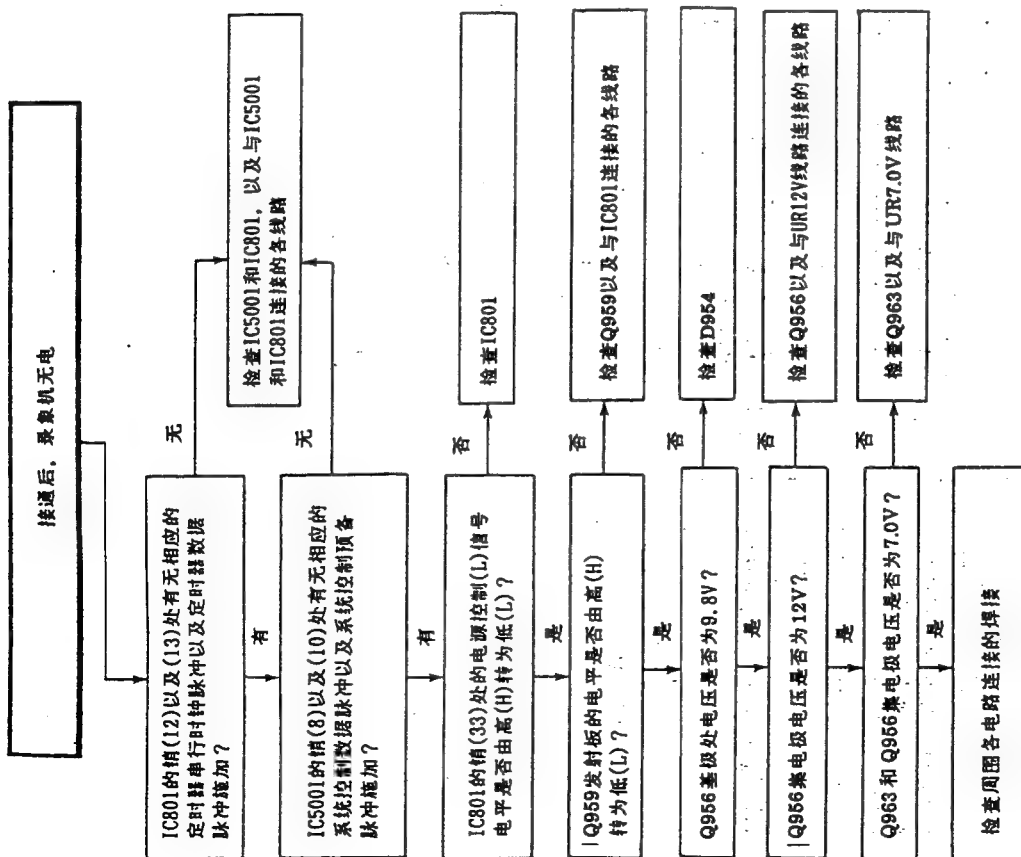
流程图 7 磁带盒室控制机构的故障检查(2)



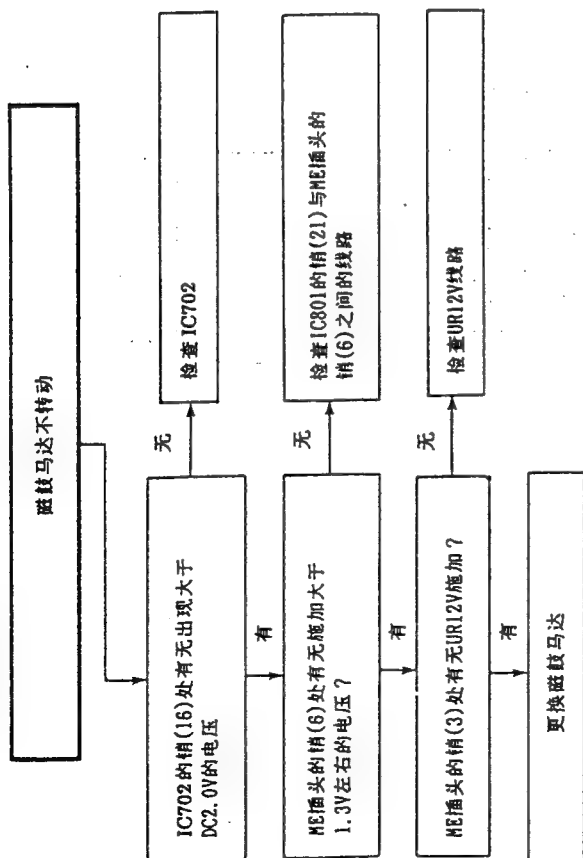
流程图 8 装带马达以及出盒动作的故障检查



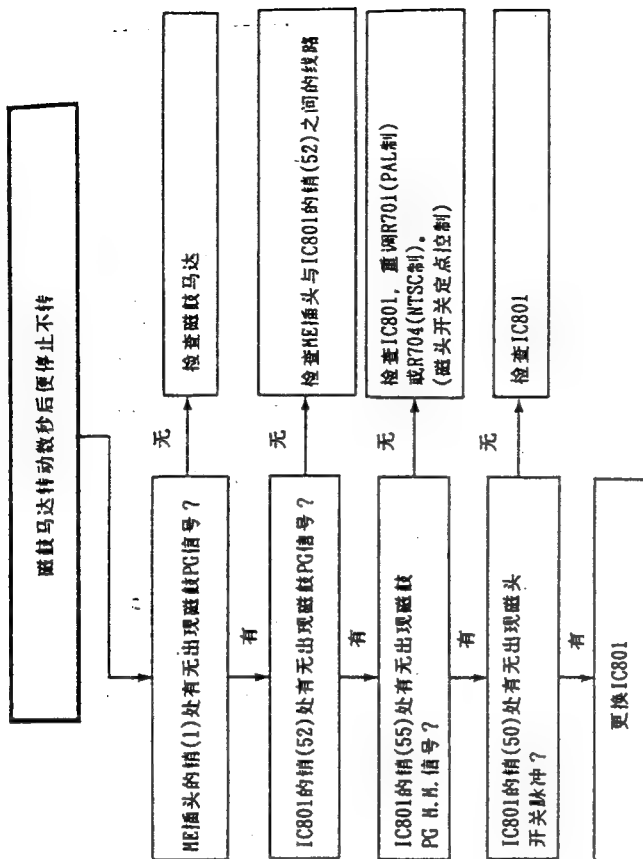




流程图 1.1 磁鼓马达的故障检查(1)



流程图 1.2 磁鼓马达的故障检查(2)







# 流程 图 15 卷带盘马达中发生器部分的故障检查

注：上接流程图 8，装带马达以及出盒动作的故障检查

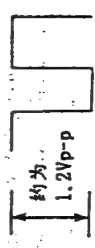
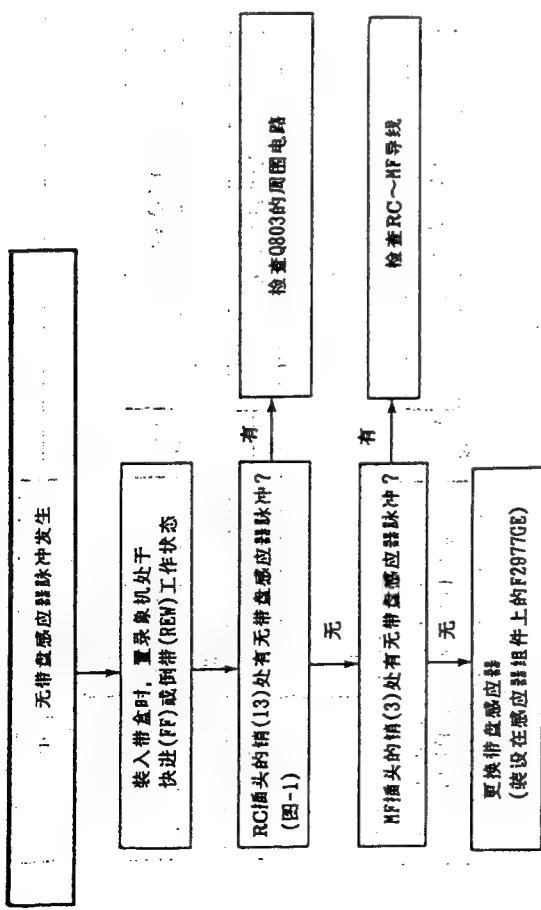


图-1

# 流程 图 16 磁头开关脉冲中的故障检查

注：上接流程图 13，磁头伺服电路的故障检查

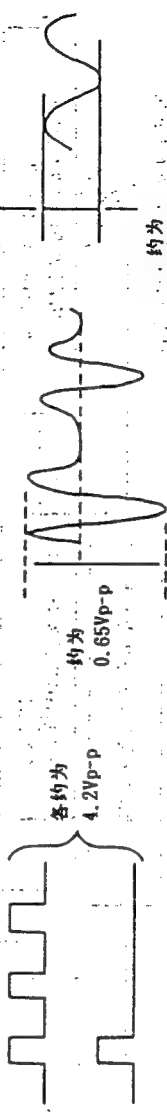
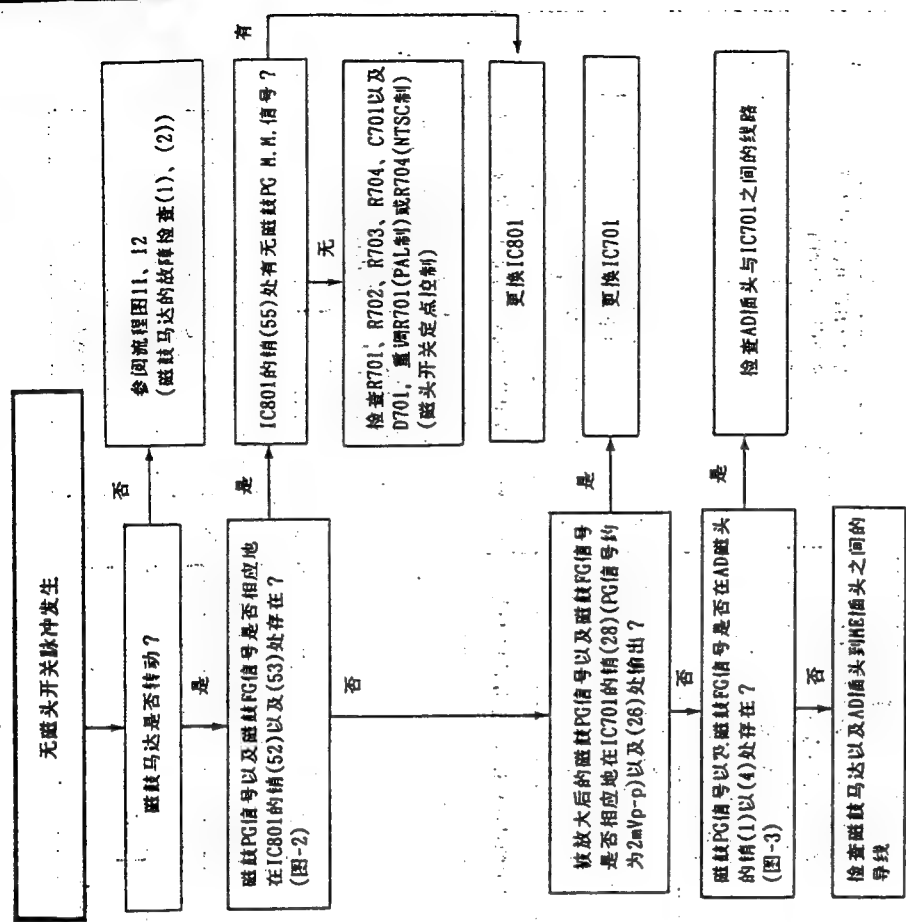


图-2

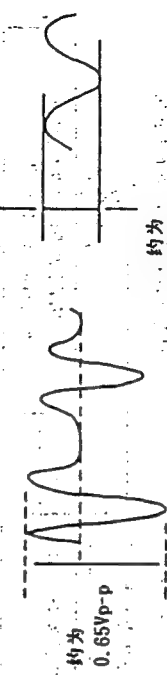
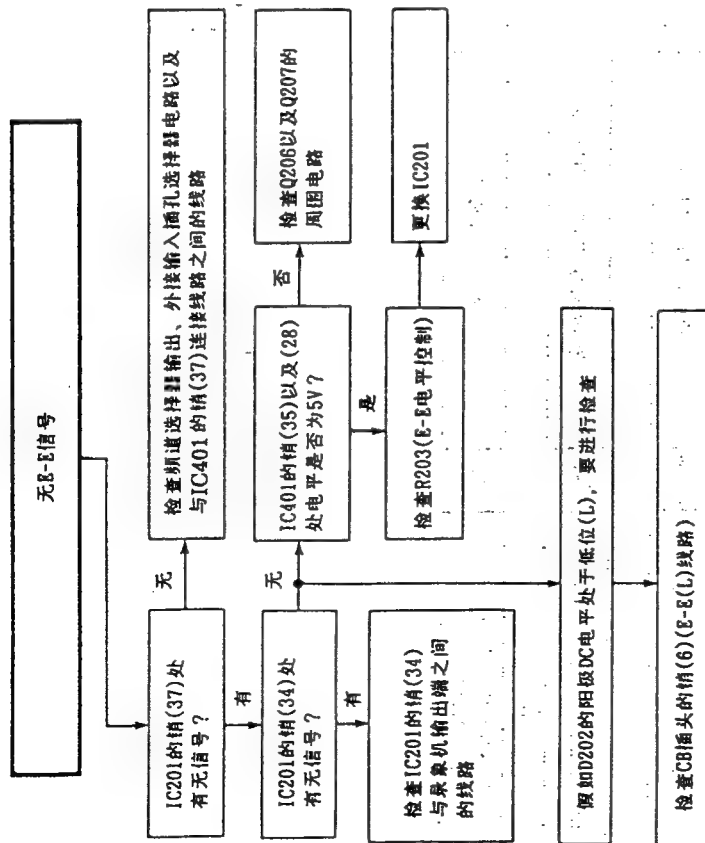


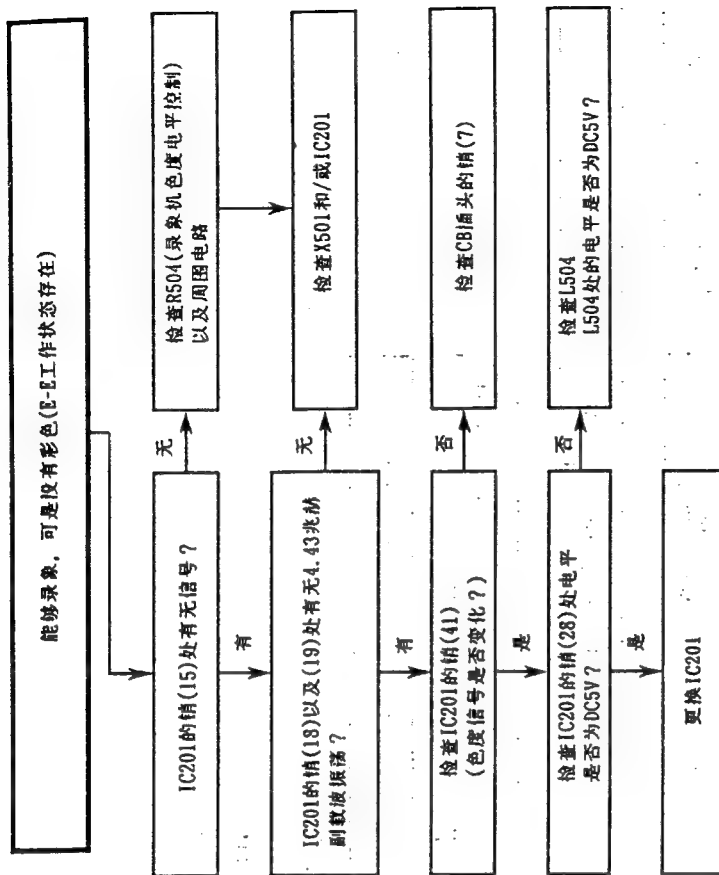
图-3

磁鼓-PG  
30mVp-p  
磁鼓-FG

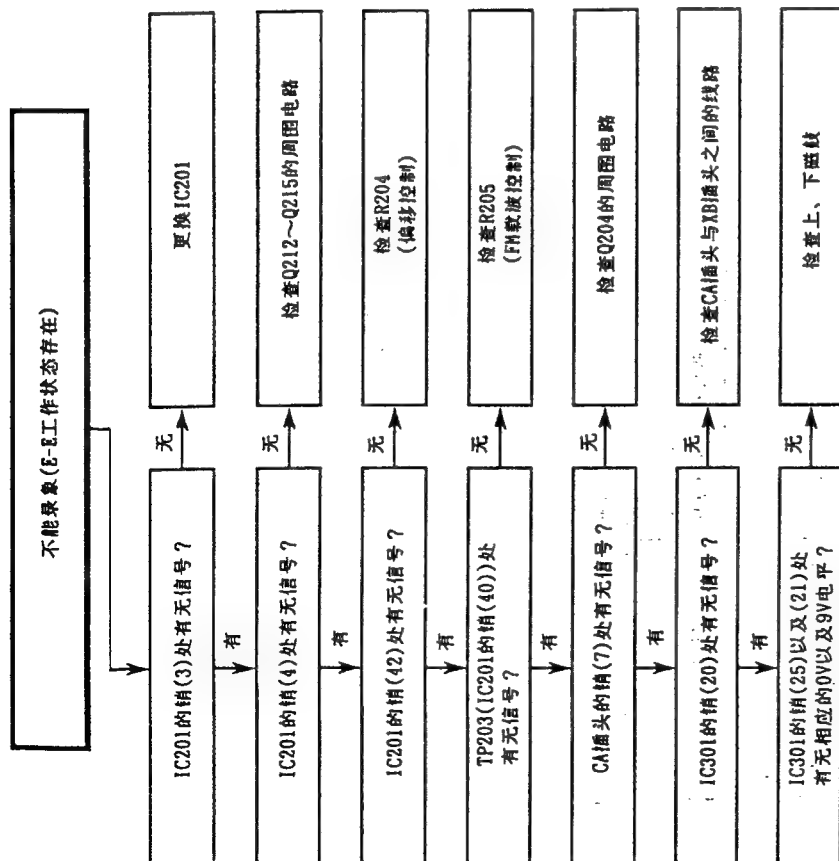
流程图 17 E-E工作状态的故障检查



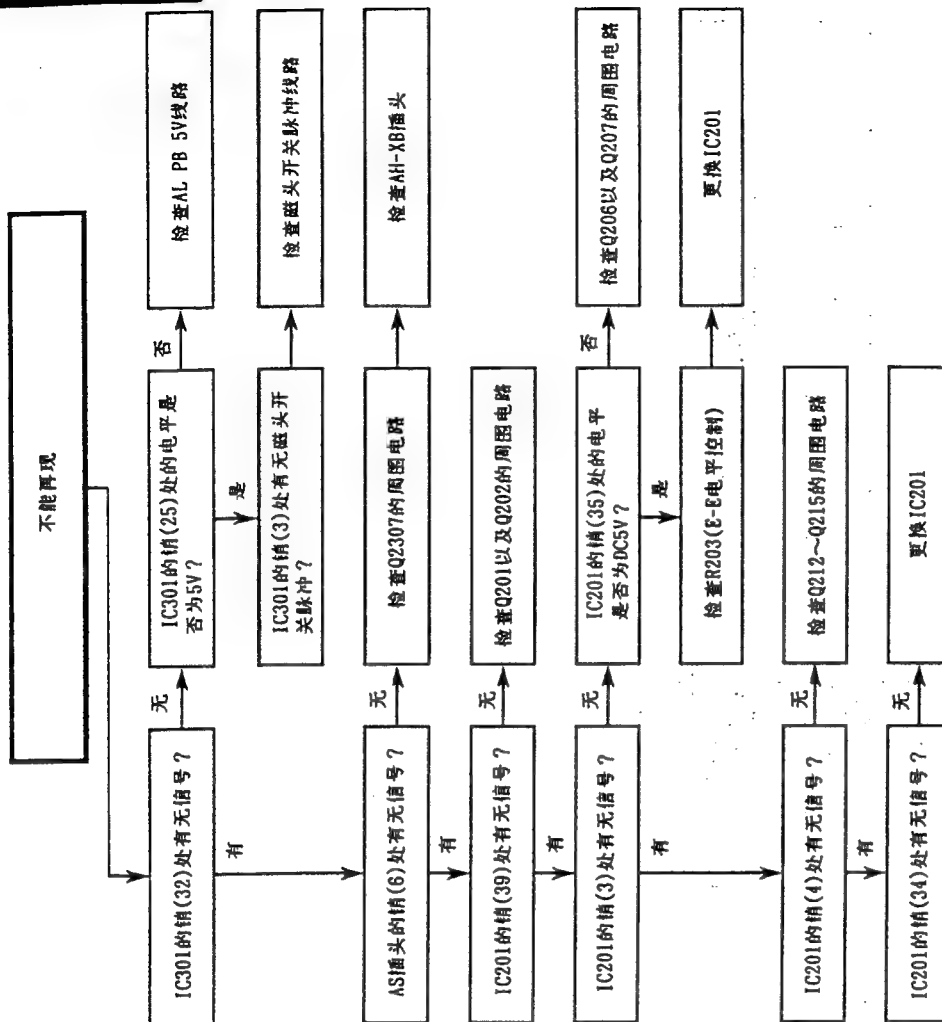
流程图 18 录象状态(色度)的故障检查



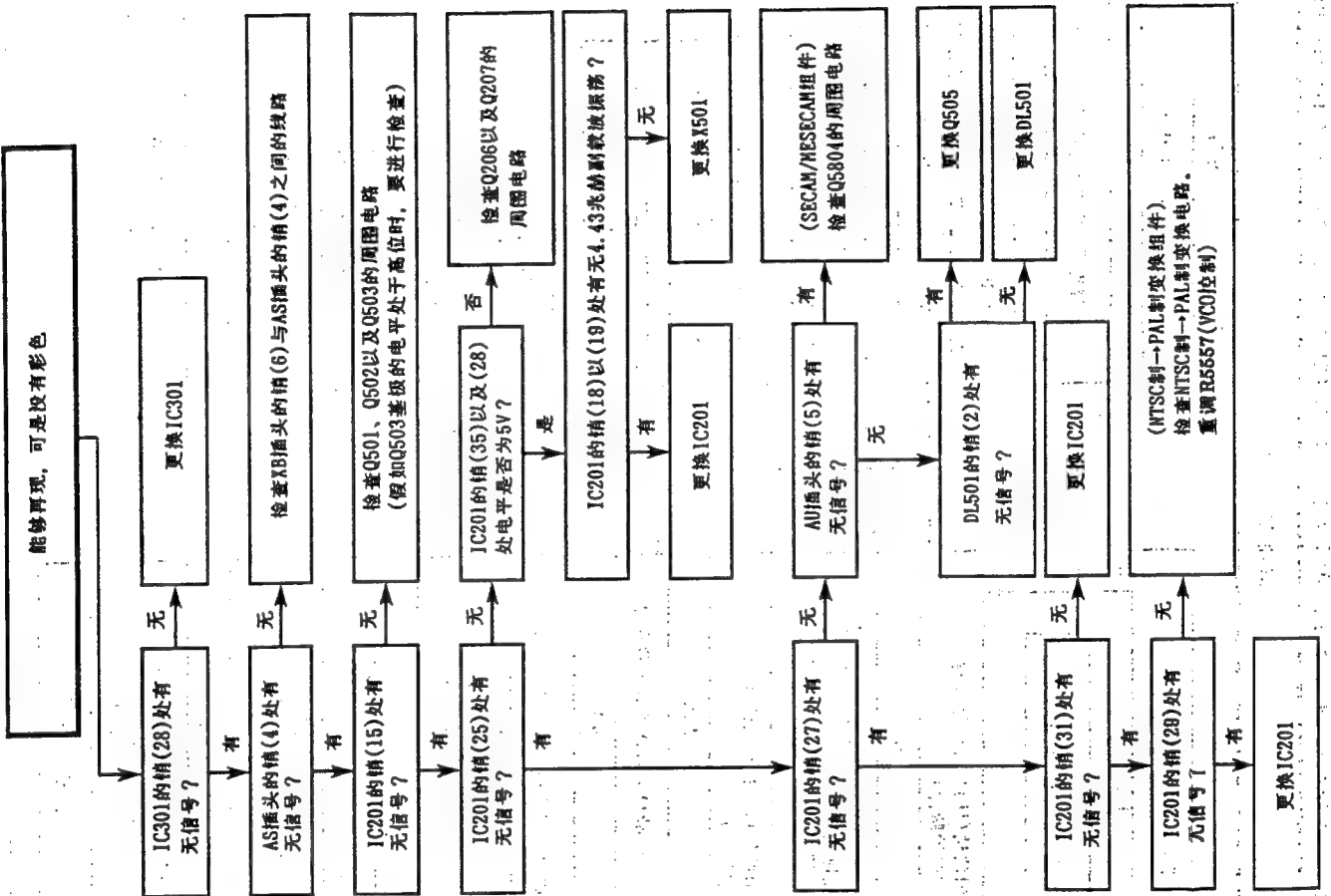
流程图 19 景象状态(亮度)的故障检查



流程图 20 再现状态(亮度)的故障检查



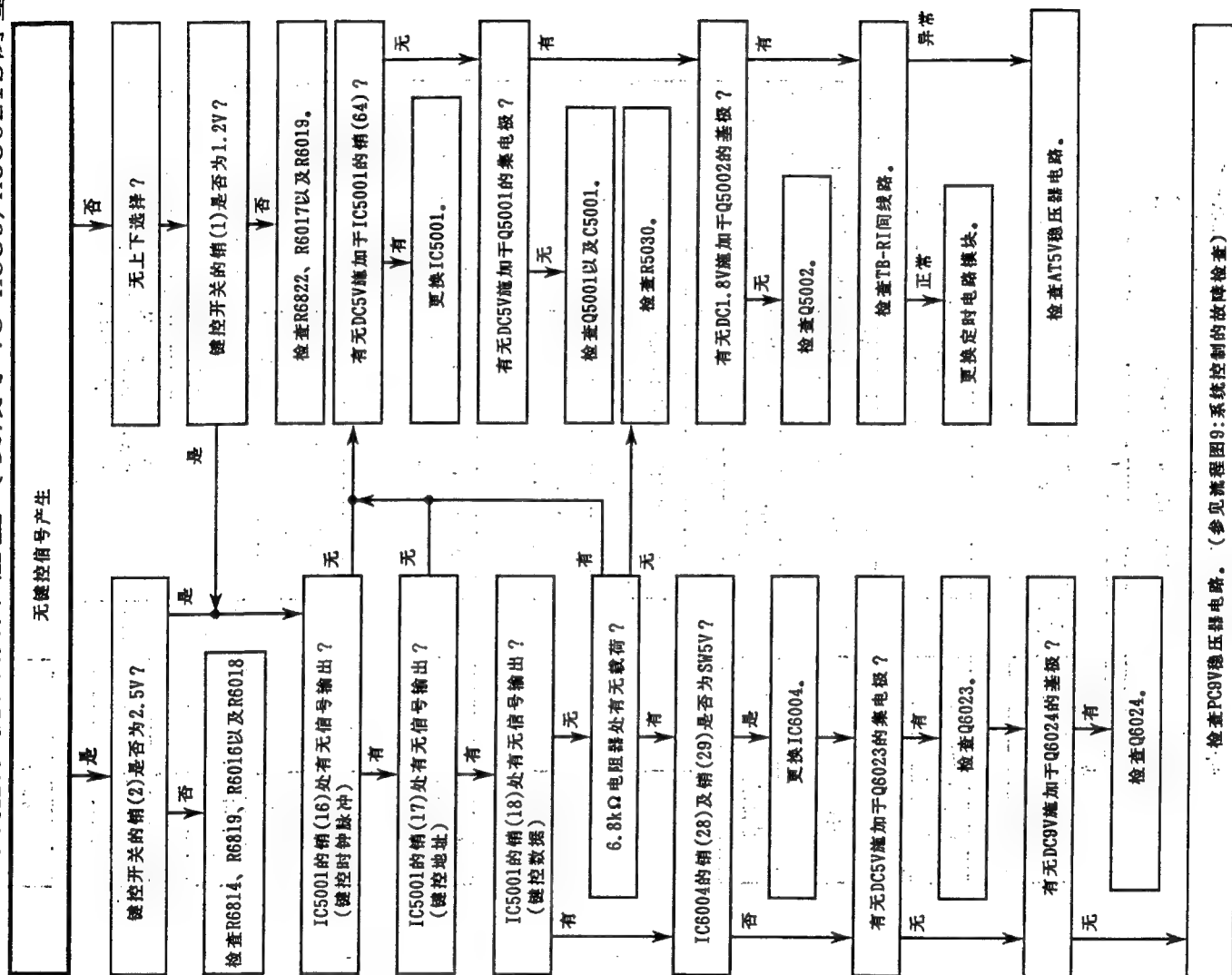
流程图 21 再现状态(色度)的故障检查



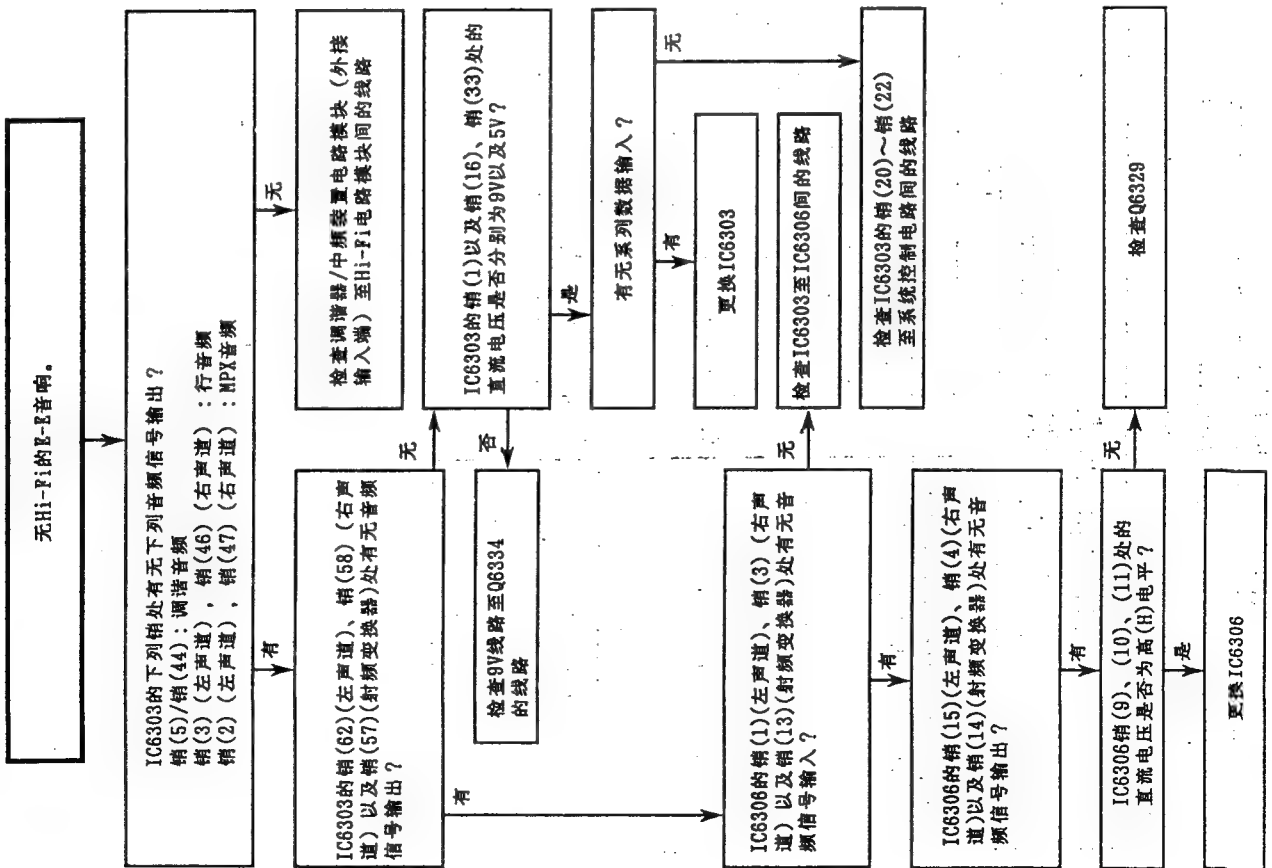


流程图 22 键控系统的故障检查 (仅限于VC-H980/H980ETS两型号)

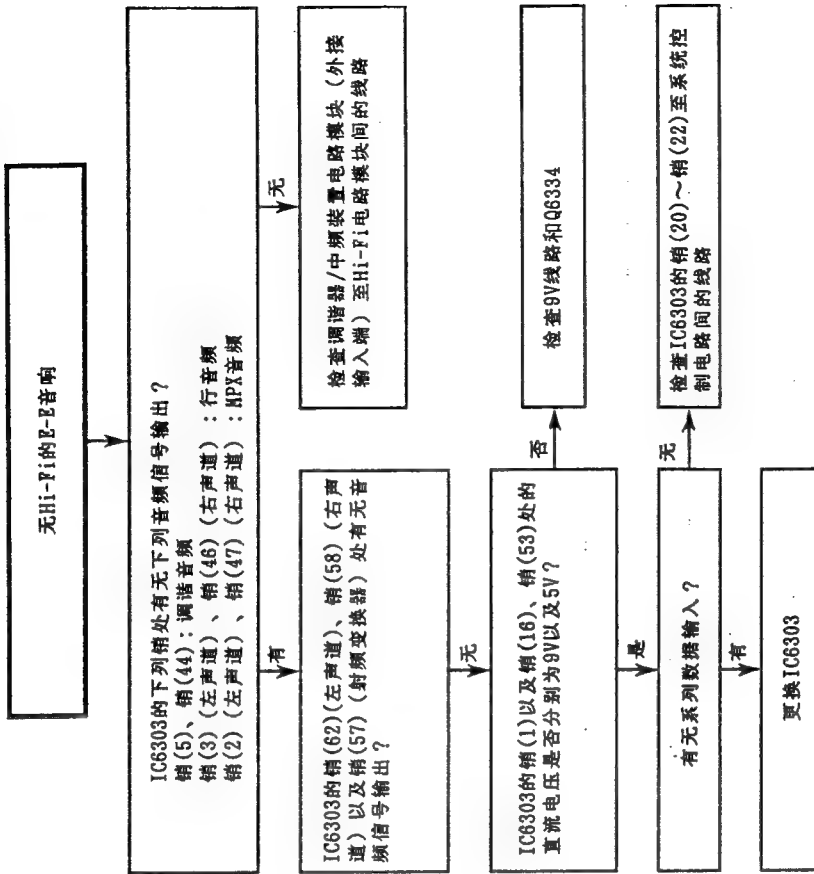
QC-H91/H91ETS  
-H96/H96ETS  
-H980/H980ETS



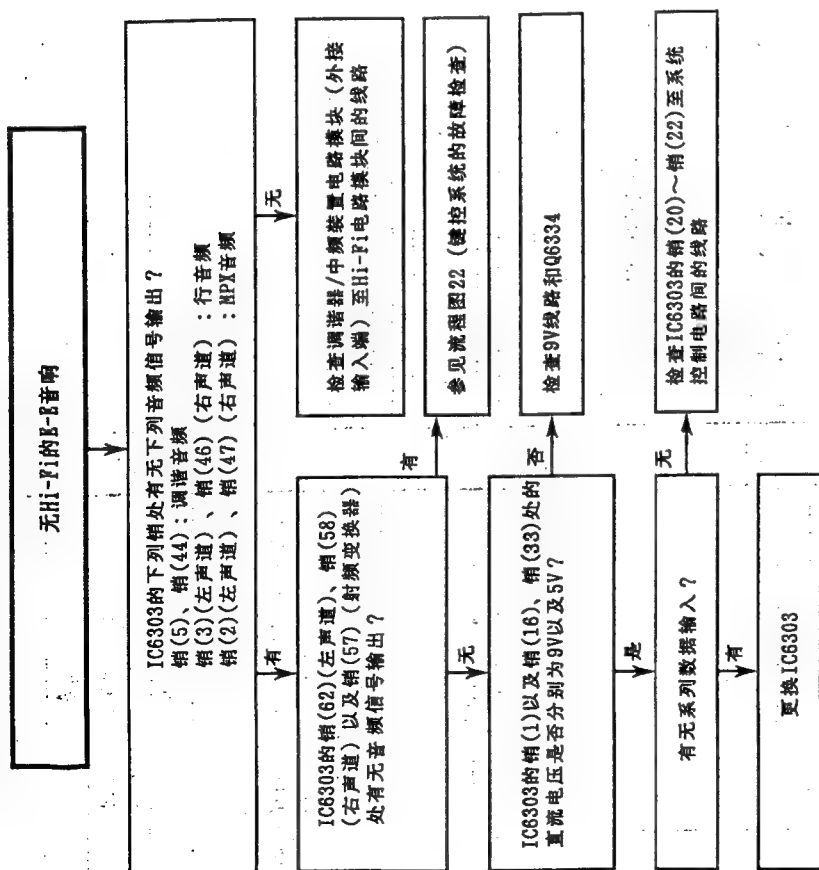
流程图 23 Hi-Fi 电路的故障检查 (1) (仅限于 VC-H96/H96ETS 两型号)



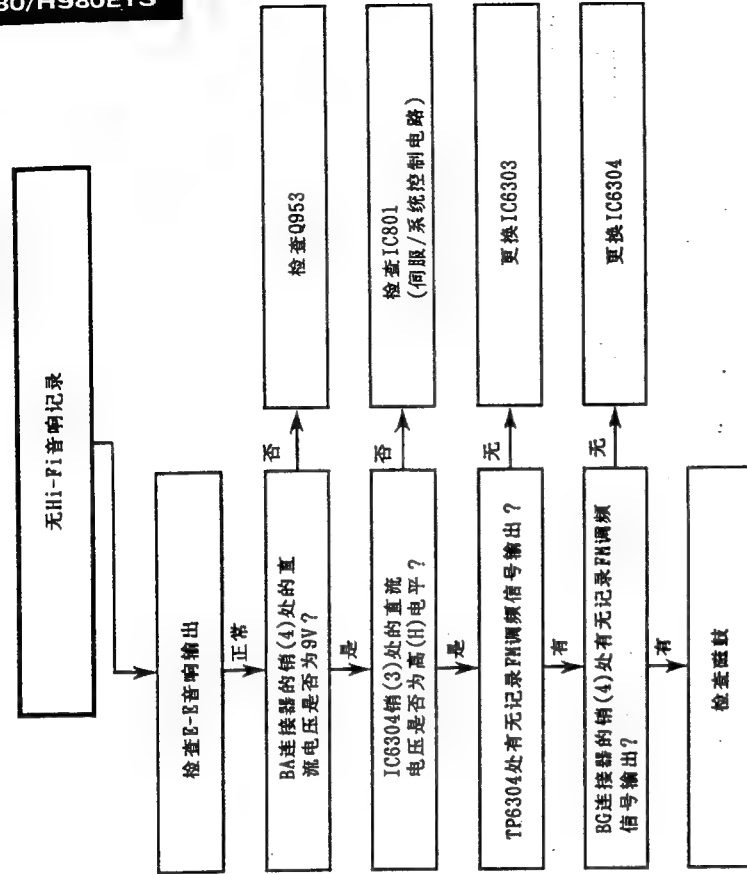
流程图 23 Hi-Fi 电路的故障检查 (1) (仅限于 VC-H91/H91ETS 两型号)



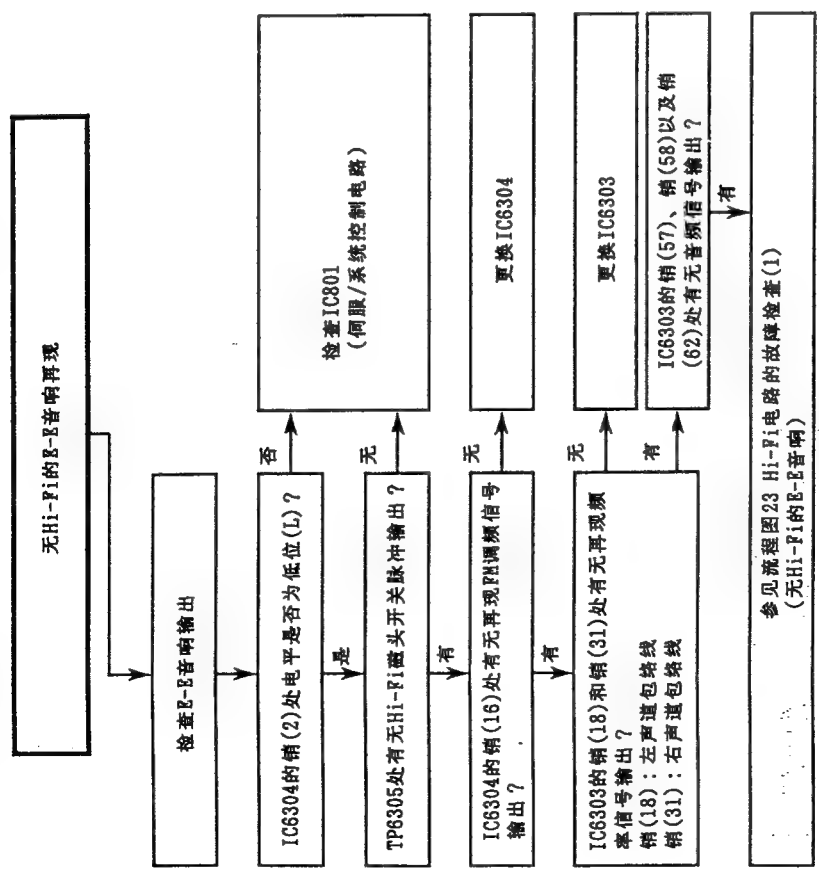
流程图 23 Hi-Fi 电路的故障检查 (1) (仅限于 VC-H980/H980ETS 两型号)



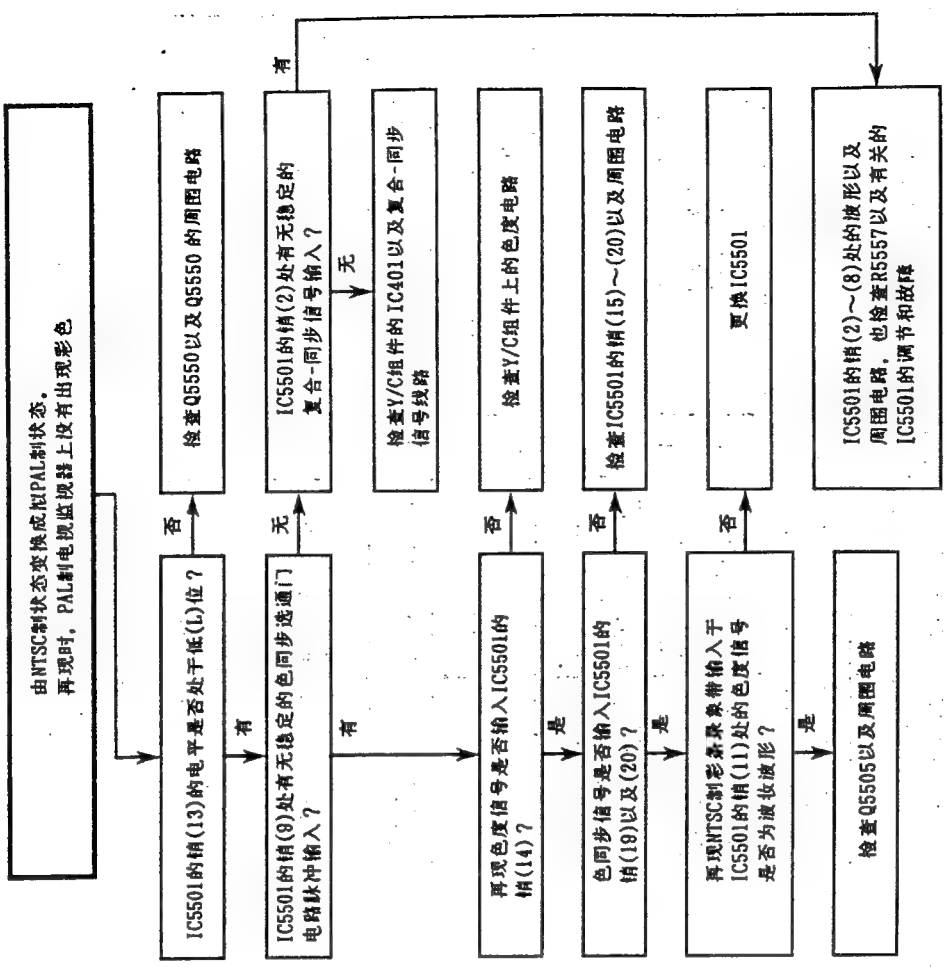
流程图 24 Hi-Fi 电路的故障检查 (2)



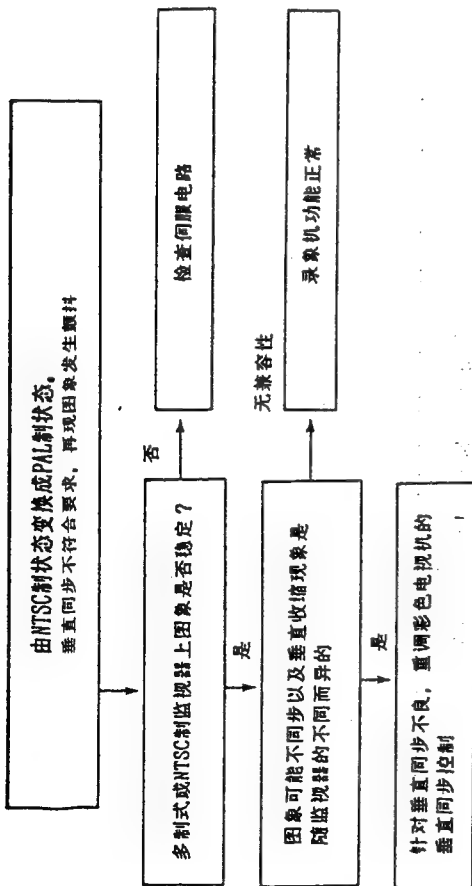
流程图 25 Hi-Fi 电路的故障检查 (3)



流程图 26 NTSC制→拟PAL制变换的故障检查 (1)

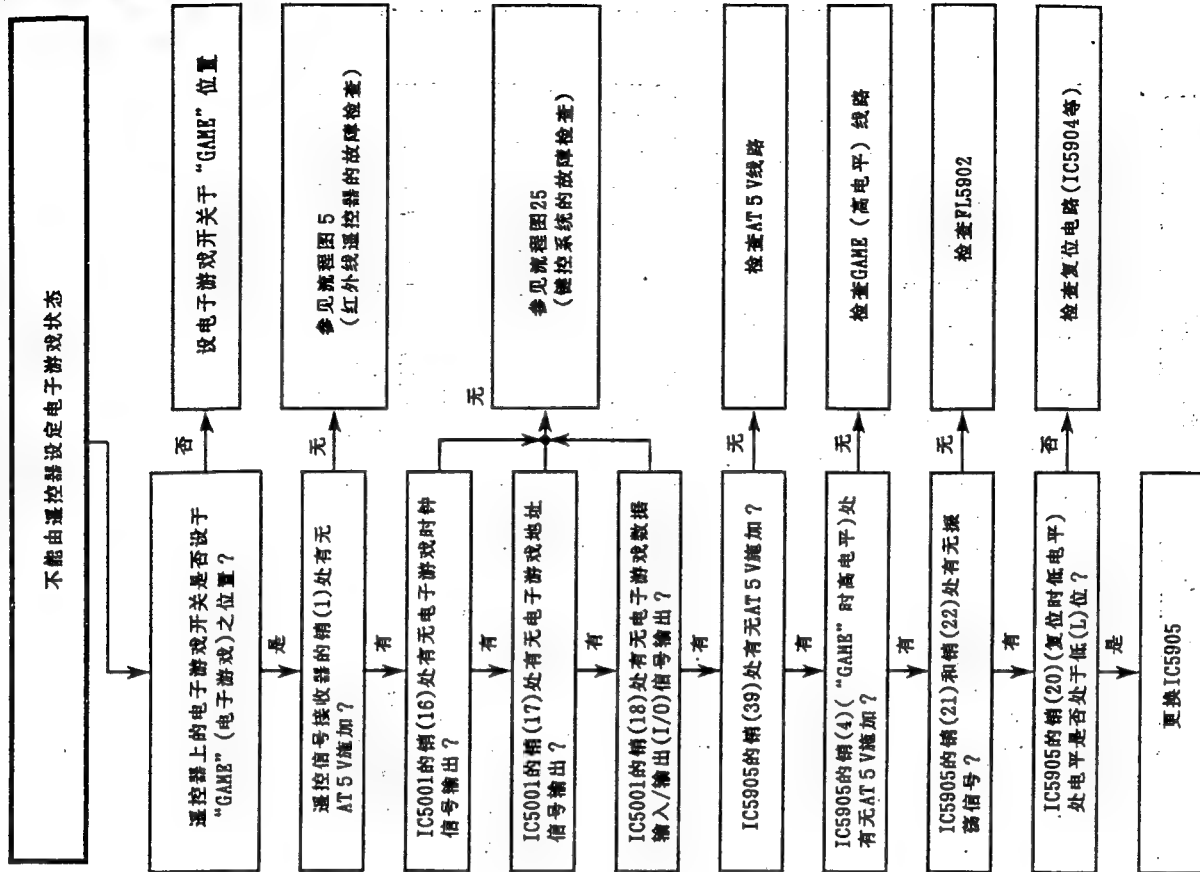


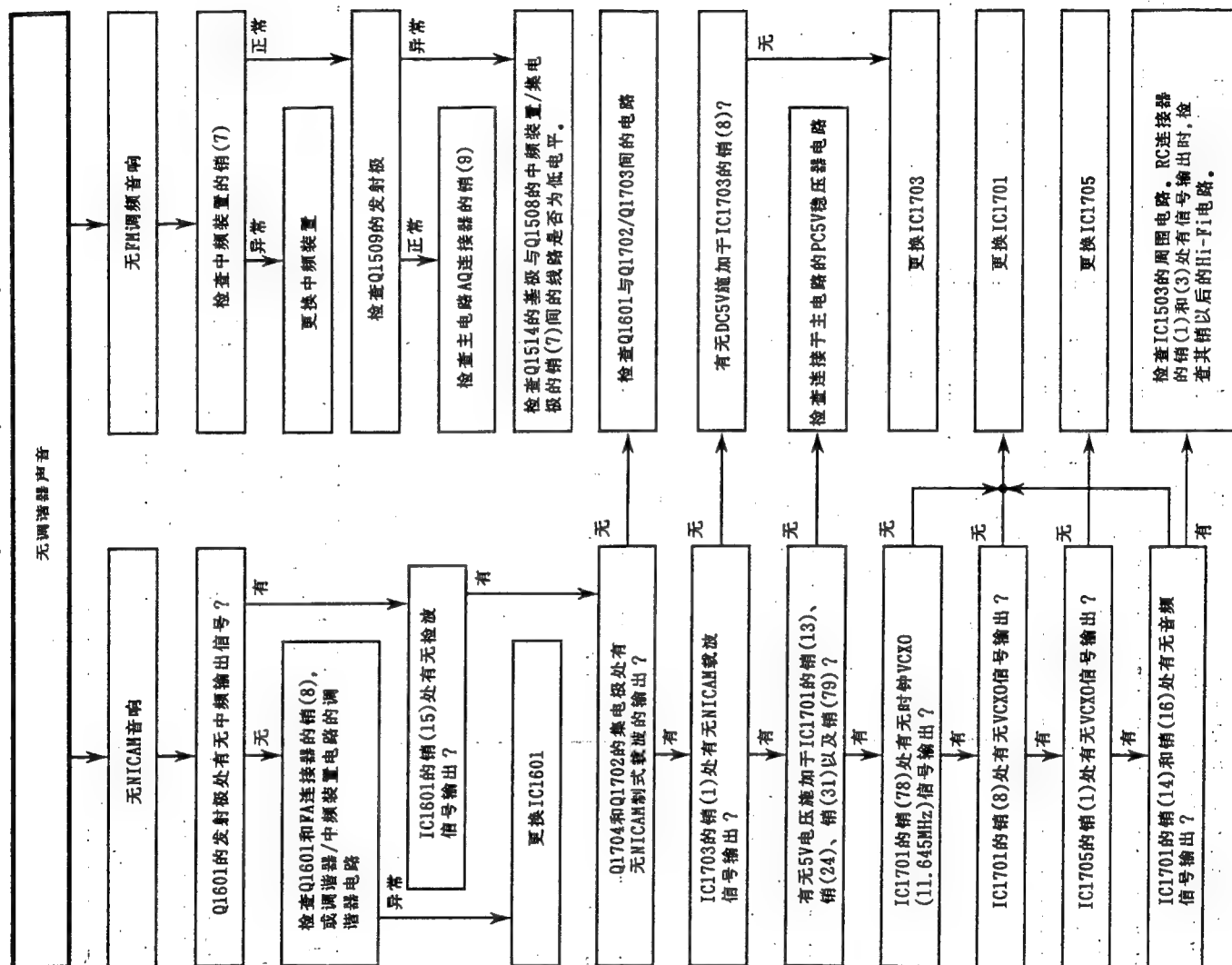
流程图 27 NTSC制→拟PAL制变换的故障检查(2)



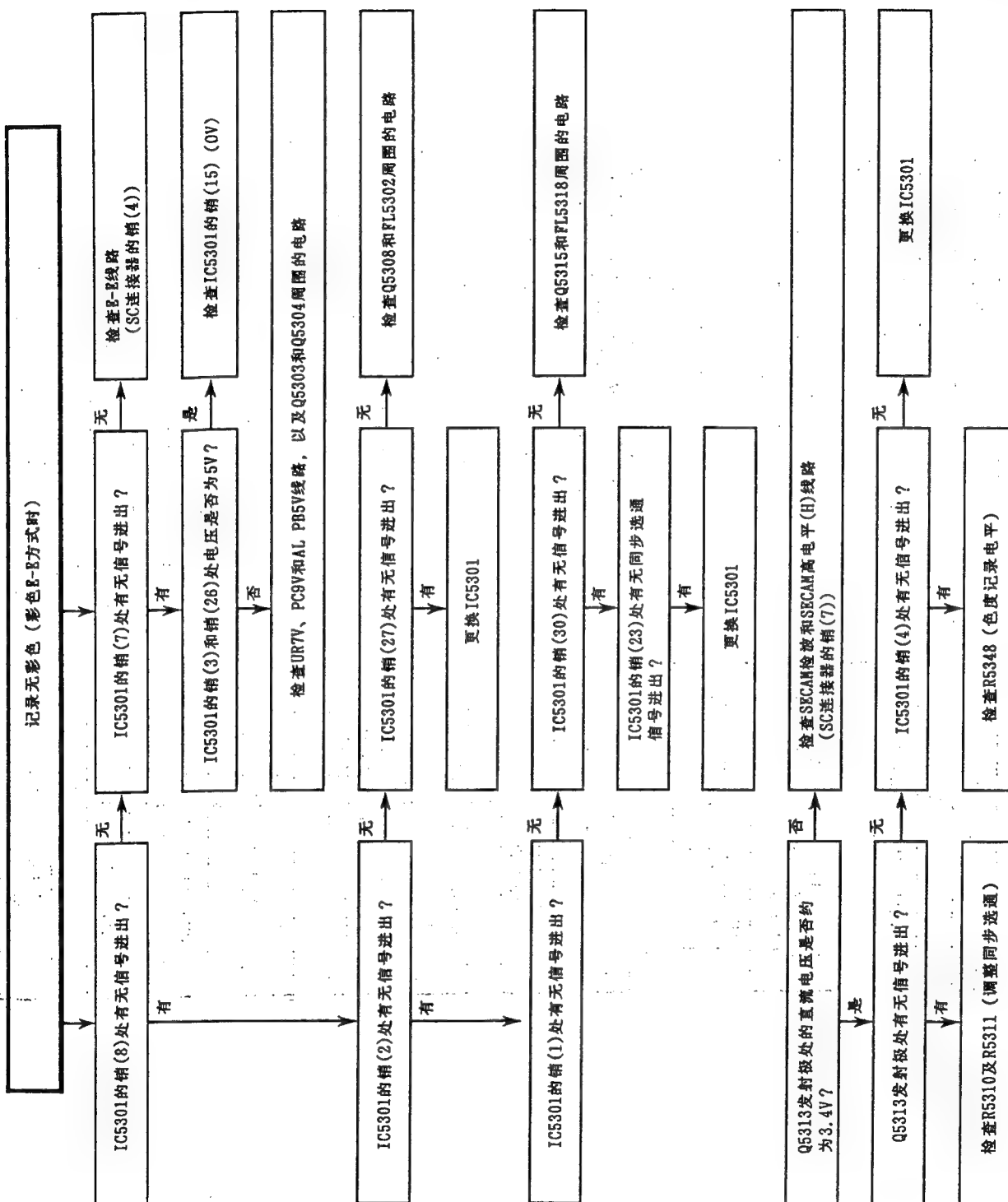
流程图 28 电子游戏系统的故障检查仅限于

VC-H96/H96ETS/H980 三型号

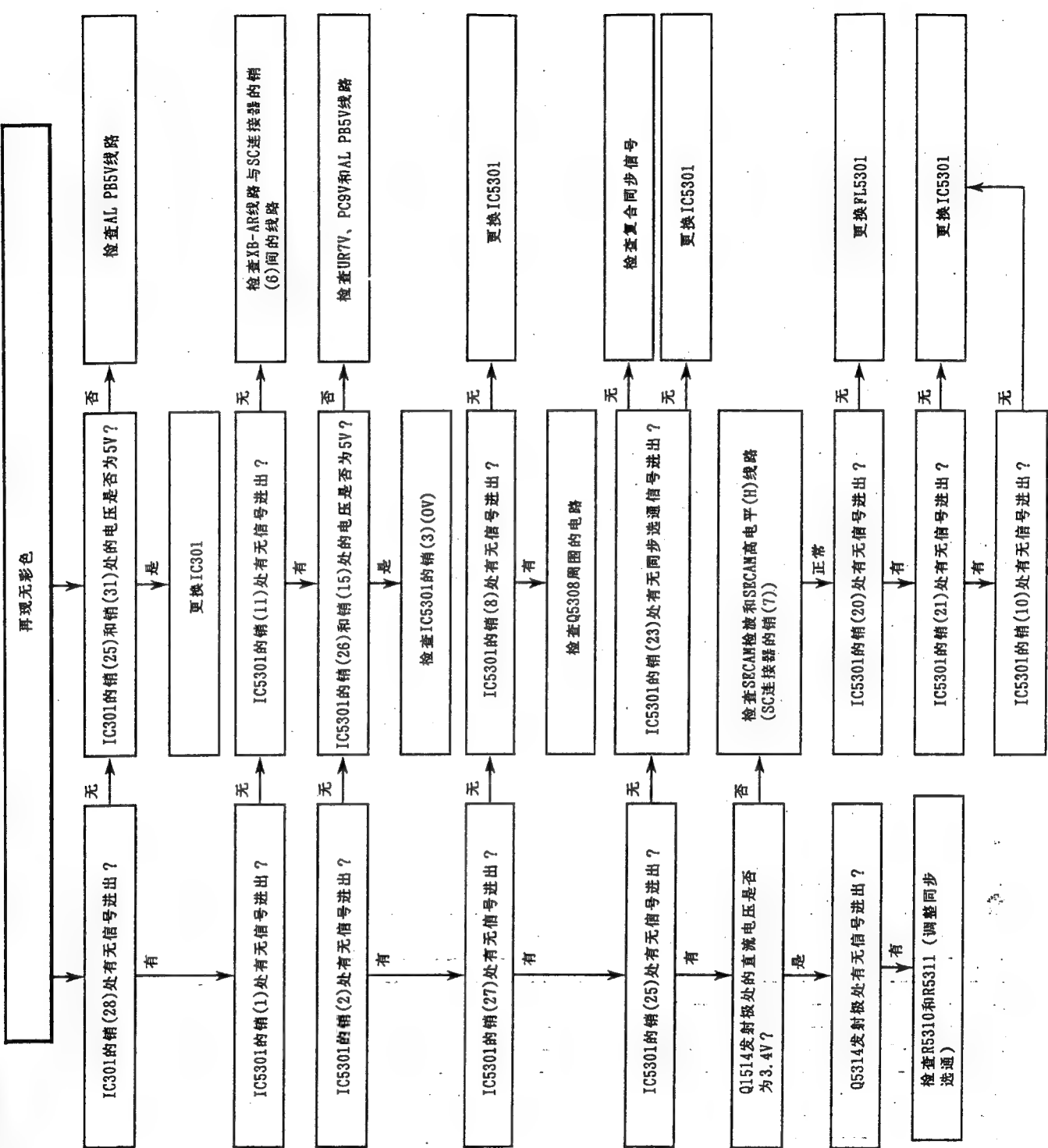




流程图 30 SECAM制式色度记录状态时的故障检查 (VC-H91/H91ETS两型号)



流程图 31 SECAM制式色度再现状态时的故障检查 (VC-H91/H91ETS两型号)





## 定时器IC5003(E<sup>2</sup>PROM)的更换

### <拆装检查前的注意事项>

定时器装置中的IC5003 E<sup>2</sup> PROM(VHICA93C46-1)经更换后,请按下述步骤重新编写设定其记忆内容。  
IC5003 E<sup>2</sup> PROM记忆内容的出厂设定,应其型号的不同而异。  
因此,更换后,有必要对其记忆内容按要求重新编写设定之。  
另外,IC5003 E<sup>2</sup> PROM经更换后,应置录象机于慢放和静止再现状态,重新对伺服电路进行调试。

### ●E<sup>2</sup> PROM记忆内容的编写设定

1. 触按“OPERATE”(执行)按钮,以打开其电源。
2. 用一根引线短接TEST26和TEST27的搭接销(安装在定时器组件上),设录象机处于测试状态。
3. 确认电视机荧光显象管亮启正常,然后拆去引线。
4. 触按频道设定按钮,设录象机处于频道设定状态。
5. 再短接TEST26和TEST27的搭接销。为此,使录象机进入重编记忆内容之状态。
6. 借助频道上移(+)、下移(-)按钮,从I00~I19号码中选定对应功能(见下表)的正确设定。  
其号码及其功能设定按E<sup>2</sup> PROM变换关系表示于屏幕上。  
然后,根据要求,触按“DISPLAY”(表示)按钮,以选入其功能(ON);触按“CLEAR”(取消)按钮,以取消其功能的选入(OFF)。  
再现和取消按钮安装在遥控器上。  
\*触按“DISPLAY”(表示)按钮时,记忆功能号码闪现表示。  
\*触按(OFF)取消按钮时,记忆功能号码点亮。
7. 短接TEST26和TEST27的搭接销,取消录象机调试状态。
8. 再次触按“CHANNEL SET”(频道设定)按钮,取消录象机所处的频道设定状态。
9. 短接定时器电路中的J307和J308之阴极,设定内容改为十六进位制表示。这样,可以方便地对设定内容的正误进行检查。
10. 最后,触按自动电平控制(ALC)按钮,取消录象机所处的测试状态。

例:“ON”和“OFF”,用十六进位记数表示,分别记为“1”和“0”。

I00~I19的号码被分为五组,每组均由十六进位记数表示。

I19	I18	I17	I16	I15	I14	I13	I12	I11	I10	I09	I08	I07	I06	I05	I04	I03	I02	I01	I00
0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
		↓				↓				↓				↓				↓	
		4				2				0				0				0	

十六进位记数的“42000”表示于屏幕。

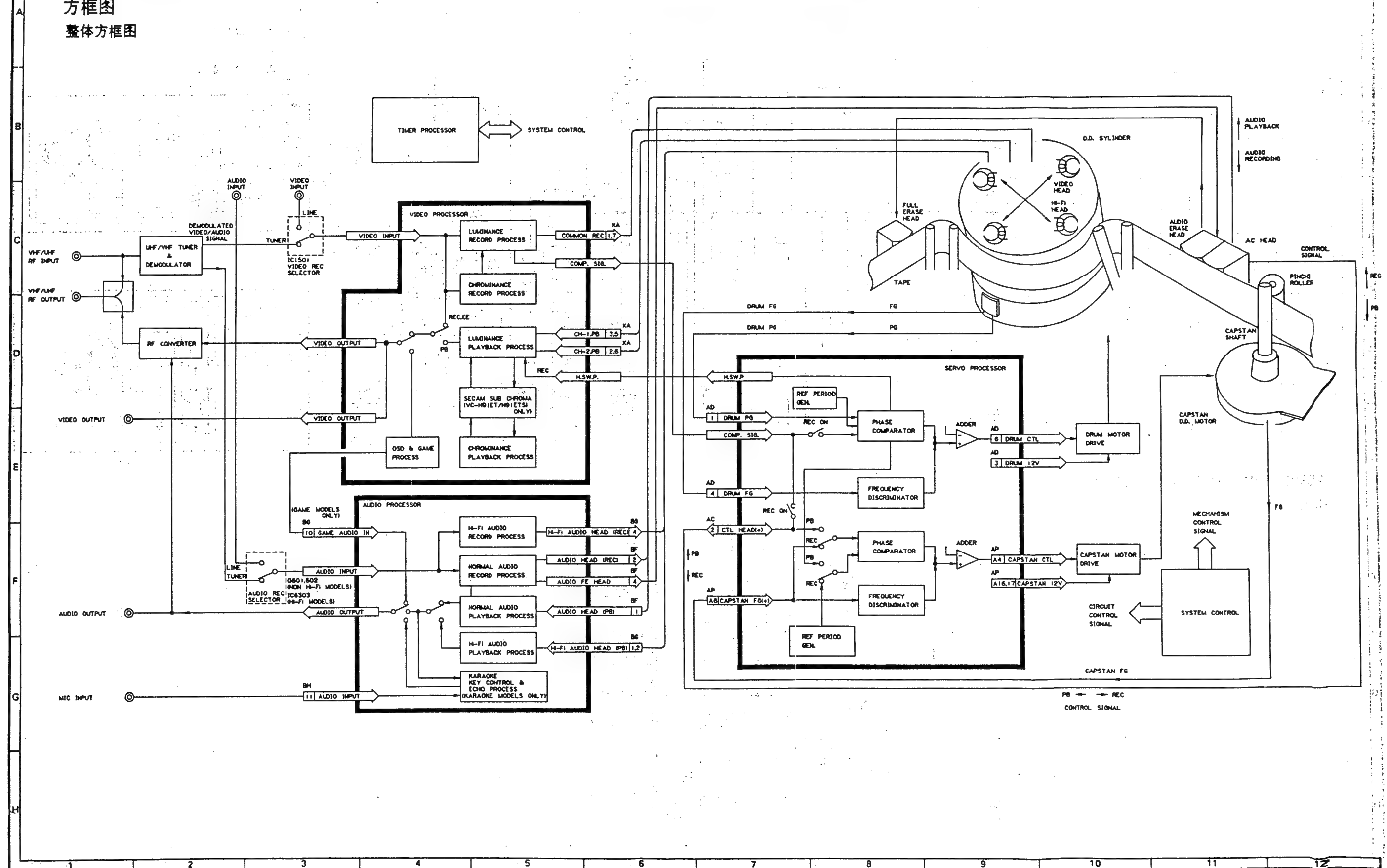
### ●E<sup>2</sup> PROM变换

注:“○”:ON “ ”:OFF

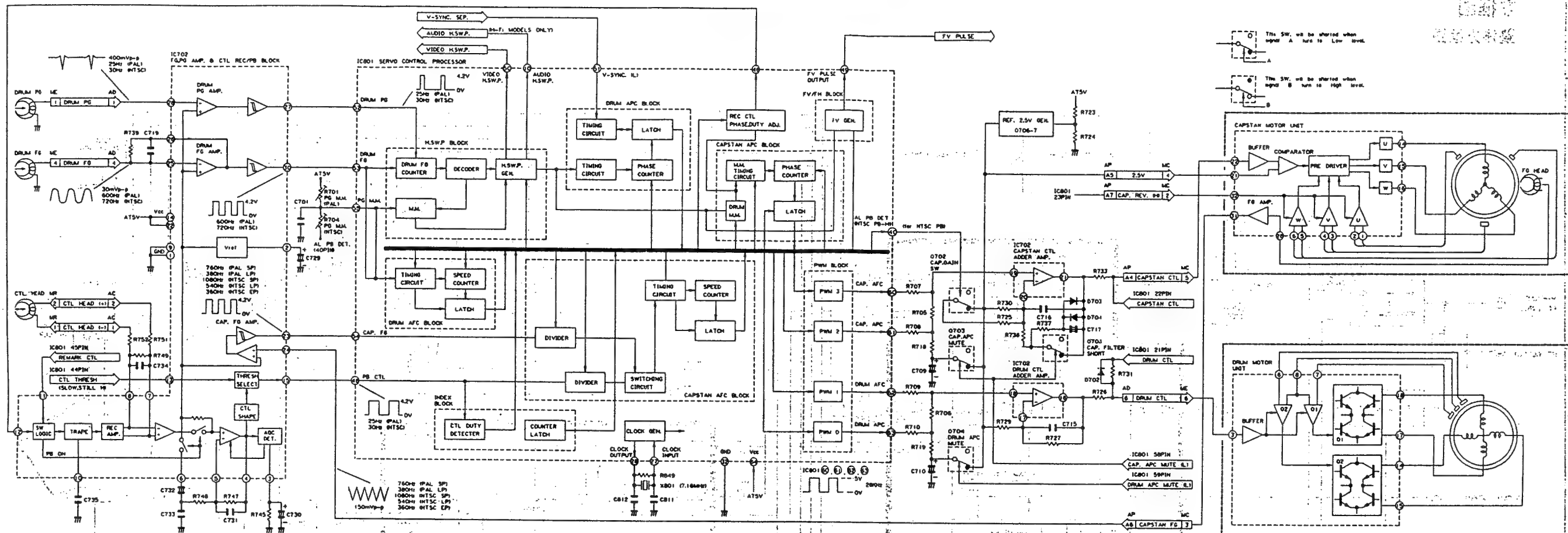
号码	功能名称				
I19	——				
I18	——				
I17	OCH				
I16	CHINESE	○		○	
I15	MPX/I <sup>2</sup> C CTL	○	○	○	○
I14	SIMUL	○	○	○	○
I13	SAP				
I12	——				
I11	COLOUR1				
I10	COLOUR0				
I09	KARAOKE MAKER				
I08	ONE SONG PLAY			○	○
I07	APMS			○	○
I06	——			○	○
I05	V BAND				
I04	VCP				
I03	LP/EP	○	○	○	○
I02	COLOUR			○	○
I01	Hi-Fi	○	○	○	○
I00	VCR				
表示序号		1C00A	0C00A	0400A	1C38E
型号		VC-H96	VC-H96ETS	VC-H91 VC-H91ETS	VC-H980 VC-H980ETS

# BLOCK DIAGRAM OVERALL BLOCK DIAGRAM

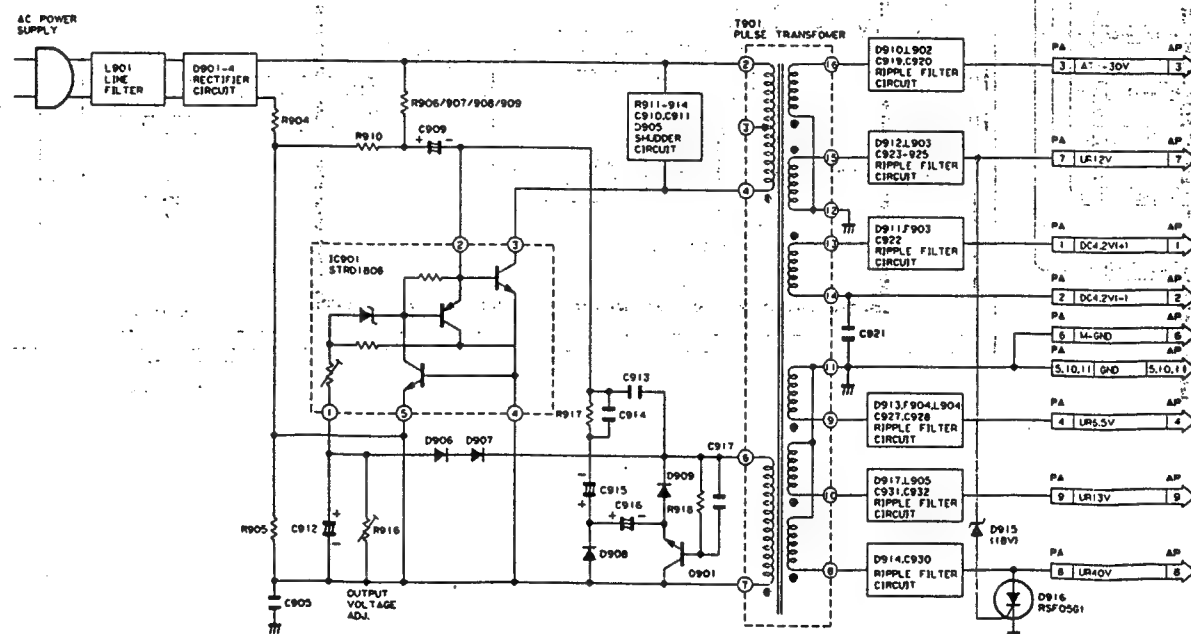
方框图  
整体方框图



### 伺服电路方框图



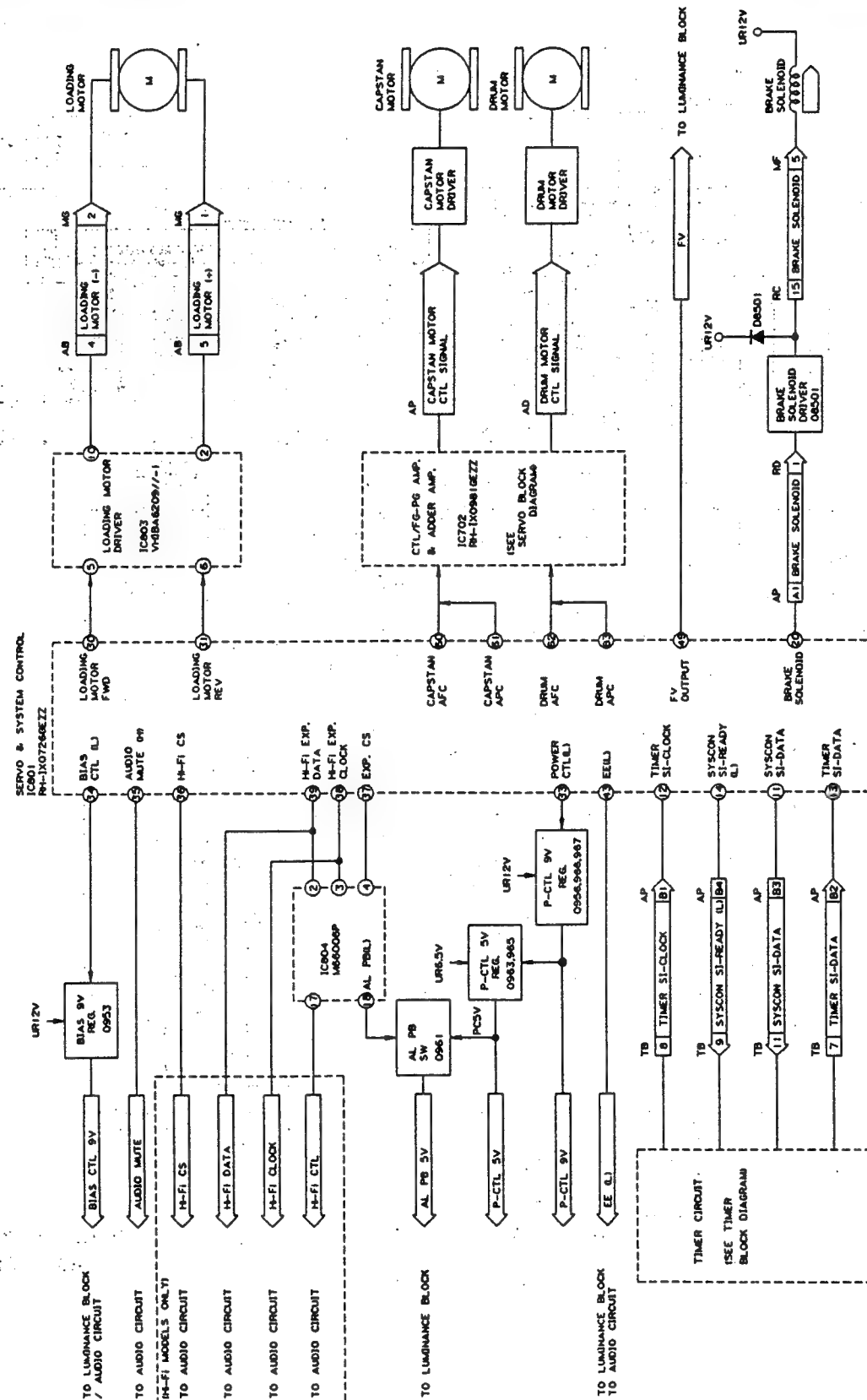
### 电源电路的方框图



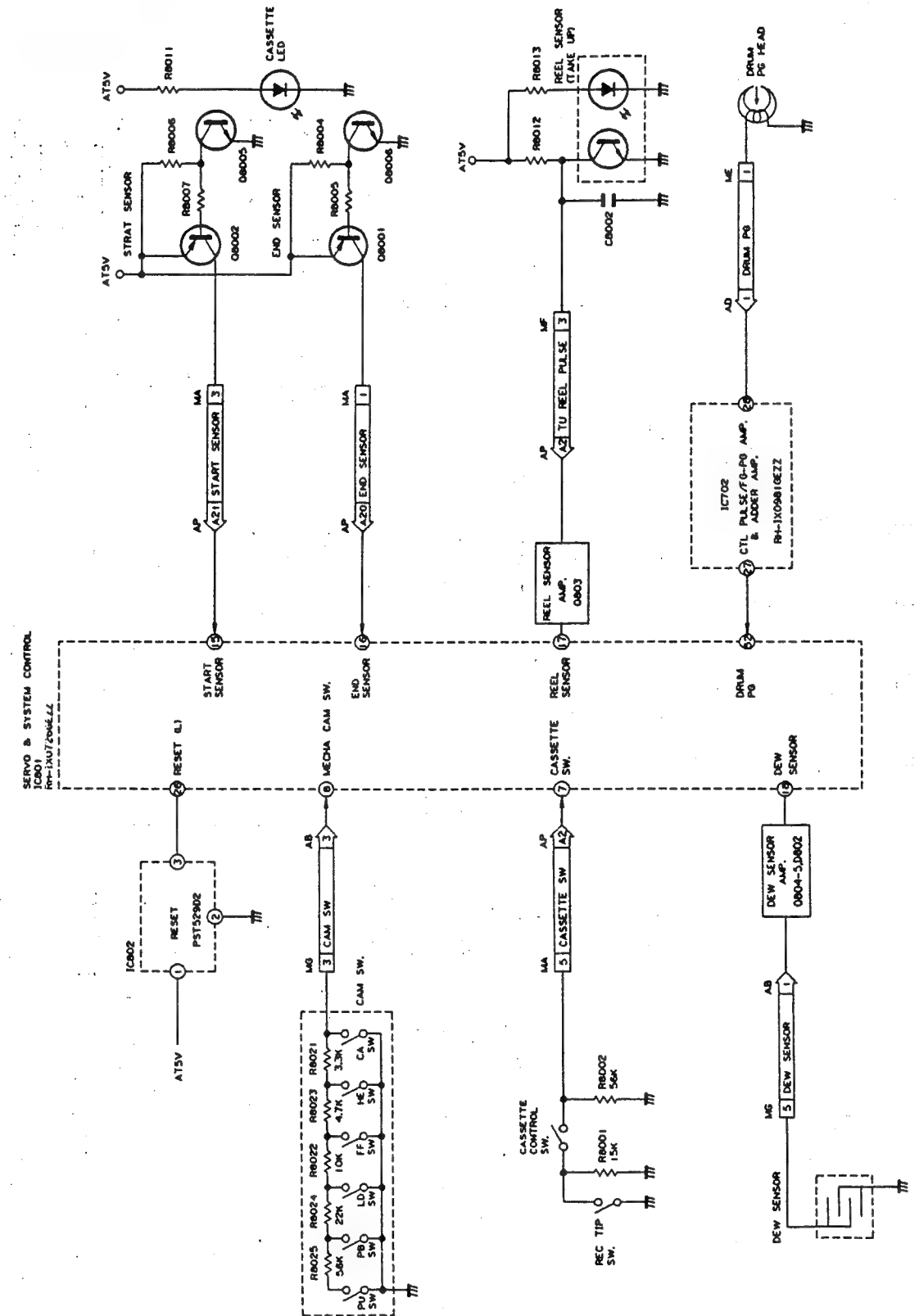
VC-H91/H91ETS  
VC-H96/H96ETS  
VC-H980/H980ETS

VC-H91/H91ETS  
VC-H96/H96ETS  
VC-H980/H980ETS

# SYSTEM CONTROL BLOCK DIAGRAM 系统控制电路方框图

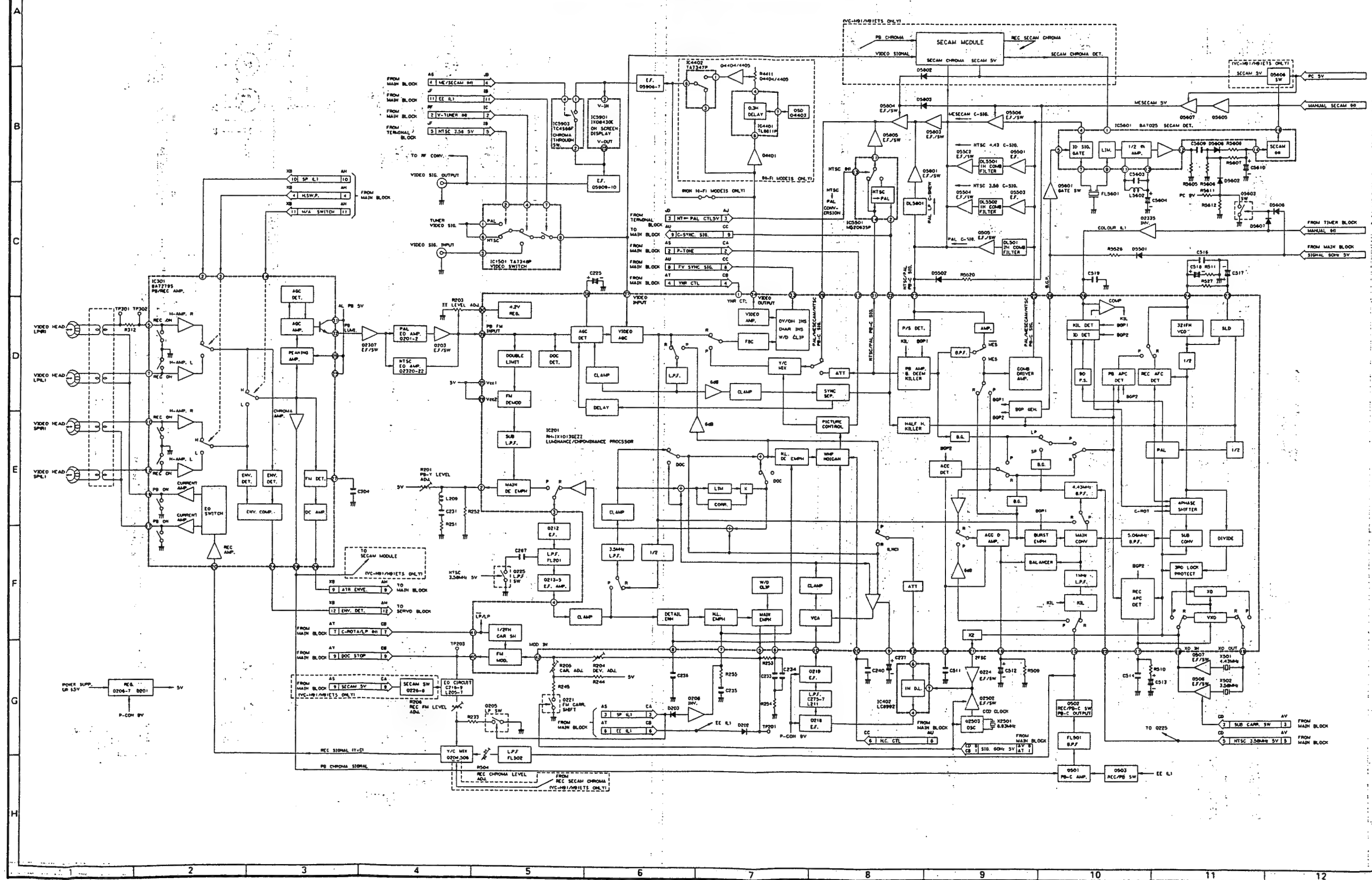


# SAFETY DEVICE BLOCK DIAGRAM 安全装置电路方框图



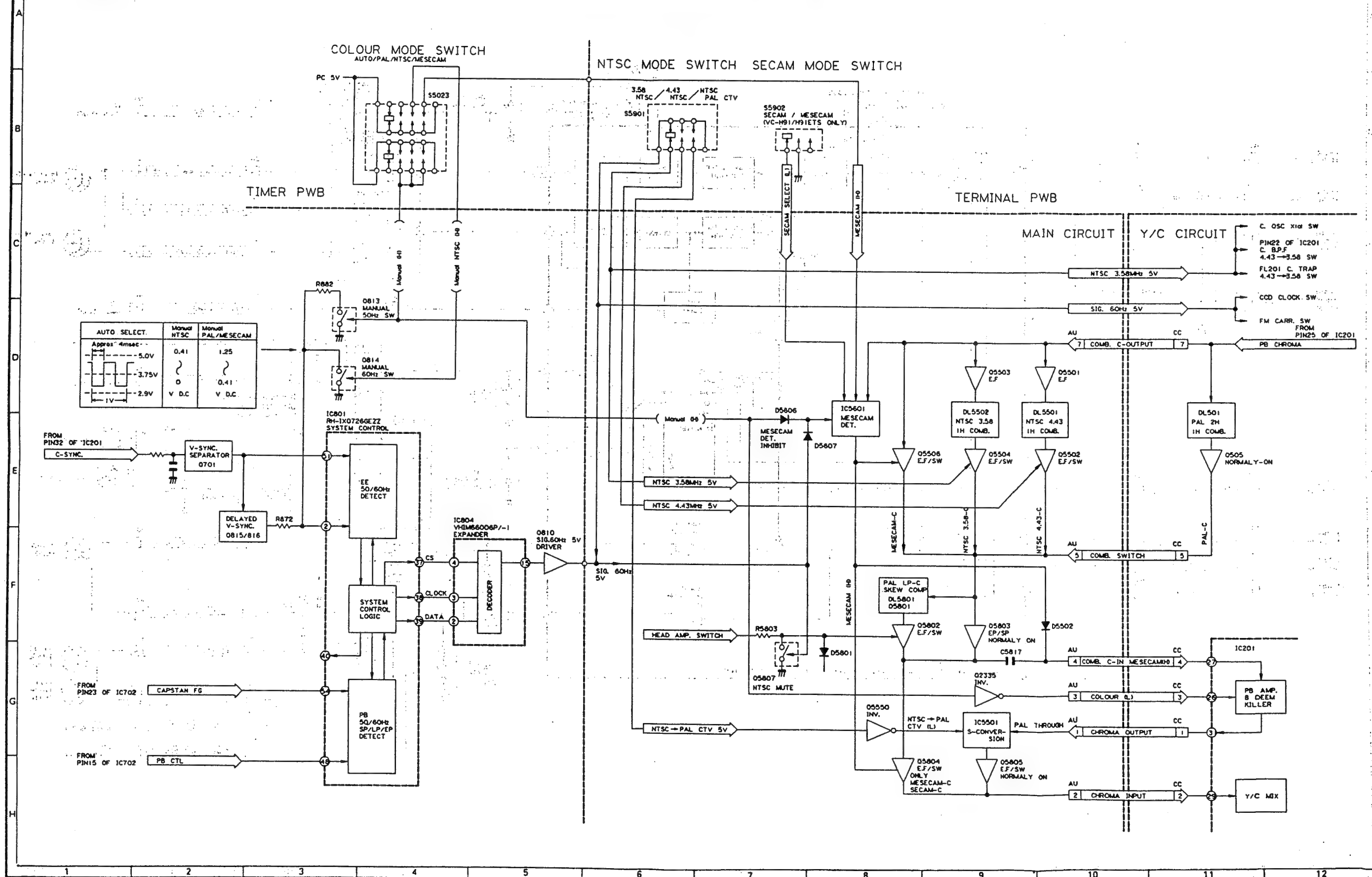
VC-H91/H91ETS  
VC-H96/H96ETS  
VC-H980/H980ETS

### 信号流程方框图



# SYSTEM SELECTION (AUTO/MANUAL) BLOCK DIAGRAM

制式选择(自动/手动)电路方框图

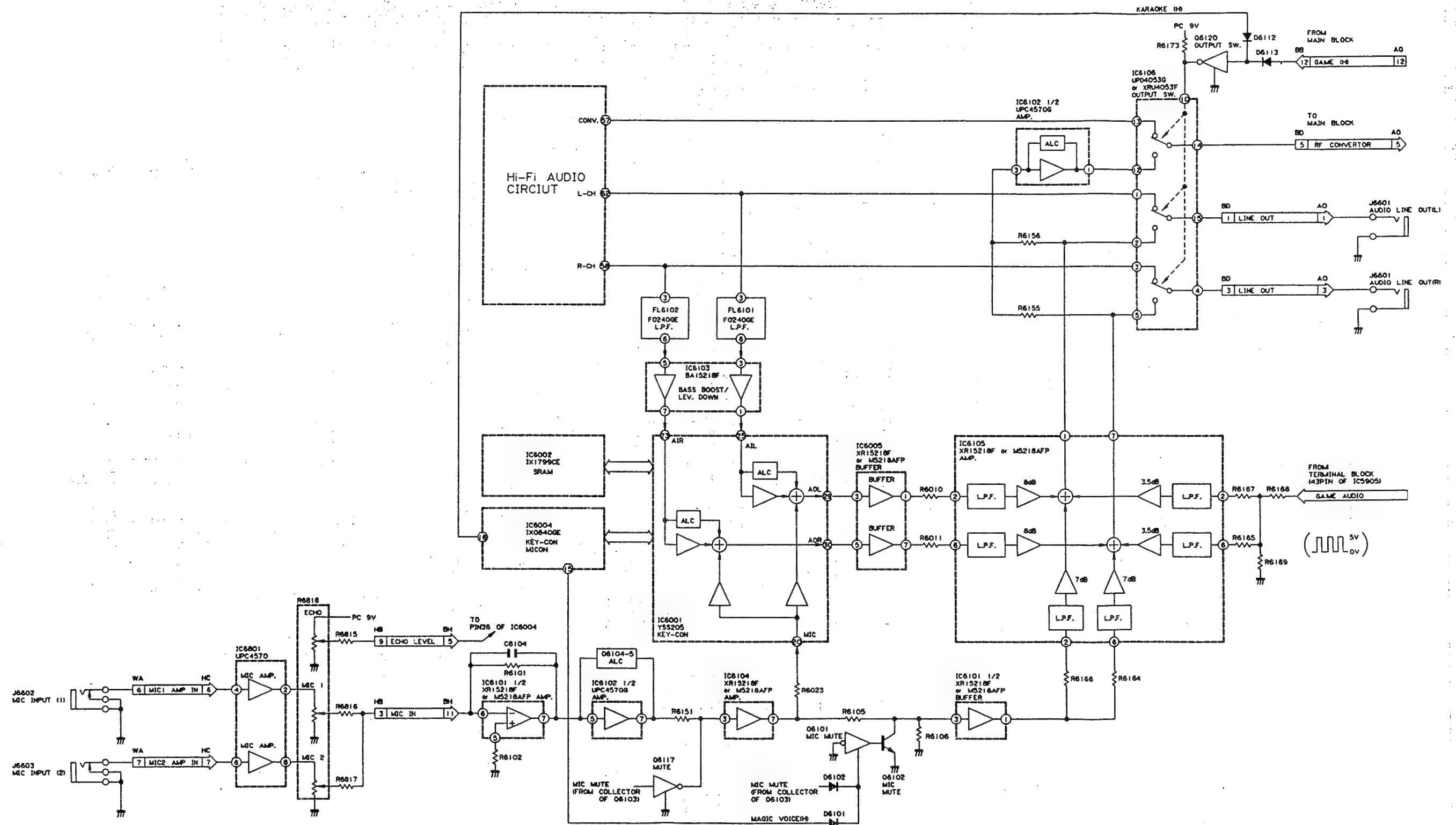






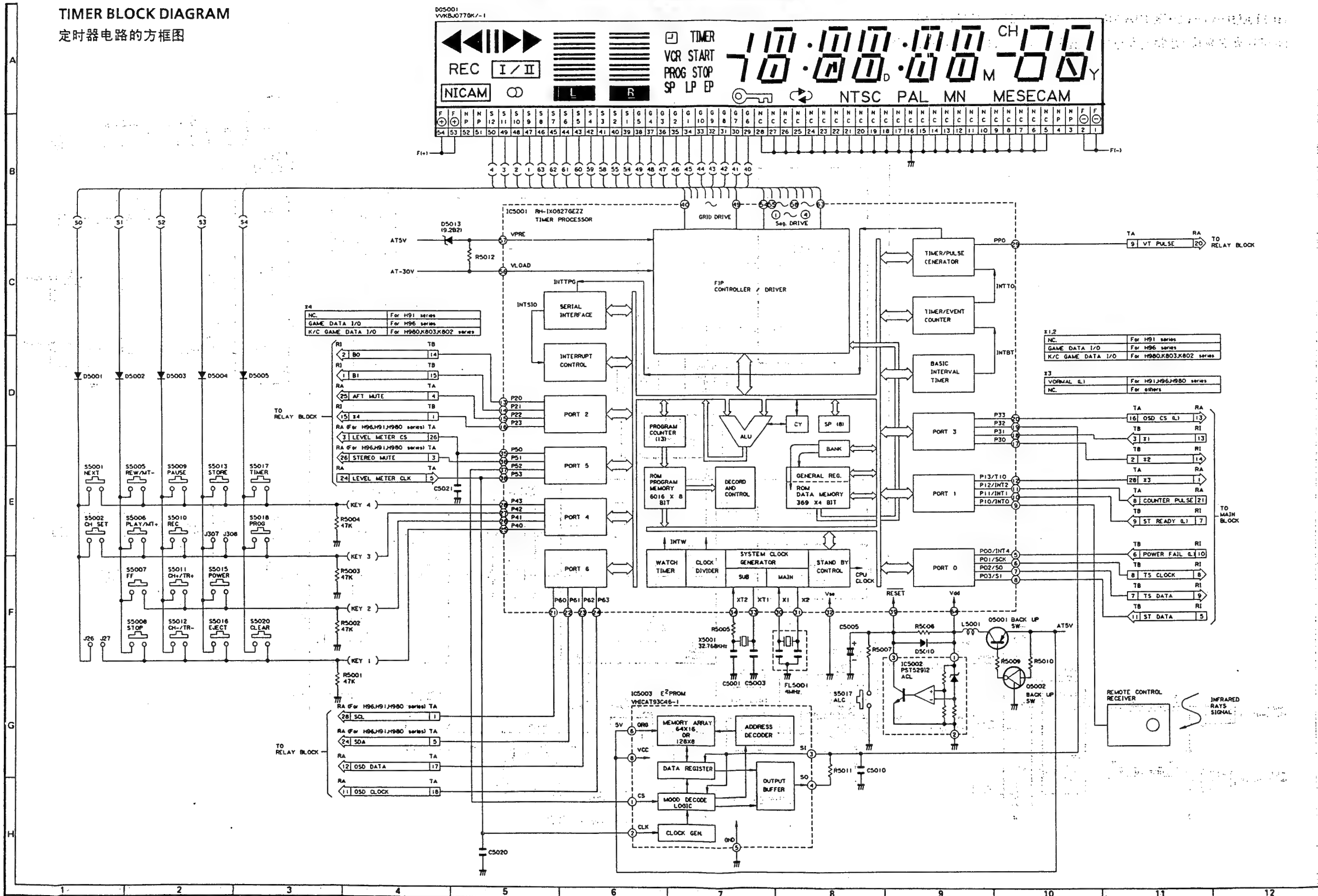
# Hi-Fi AUDIO BLOCK DIAGRAM (VC-H980/VC-H980ETS)

Hi-Fi(高保真度)音频装置电路方框图 (VC-H980/VC-H980ETS)

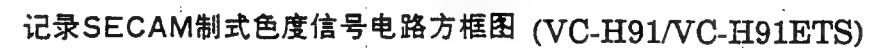




### 定时器电路的方框图



### 再现SECAM制式色度信号电路方框图 (VC-H91/VC-H91ETS)

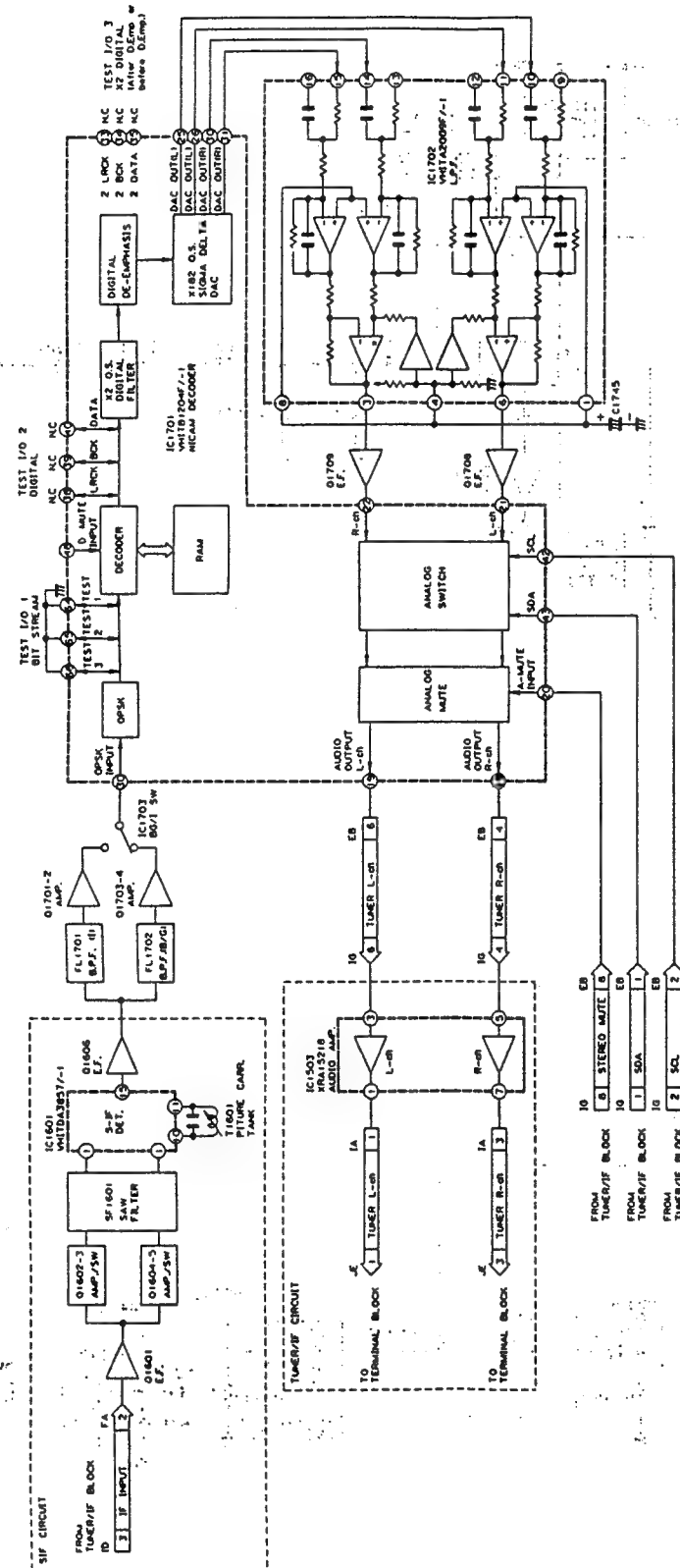


VC-H91/H91ETS  
VC-H96/H96ETS  
VC-H980/H980ETS

VC-H91/H91ETS  
VC-H96/H96ETS  
VC-H980/H980ETS

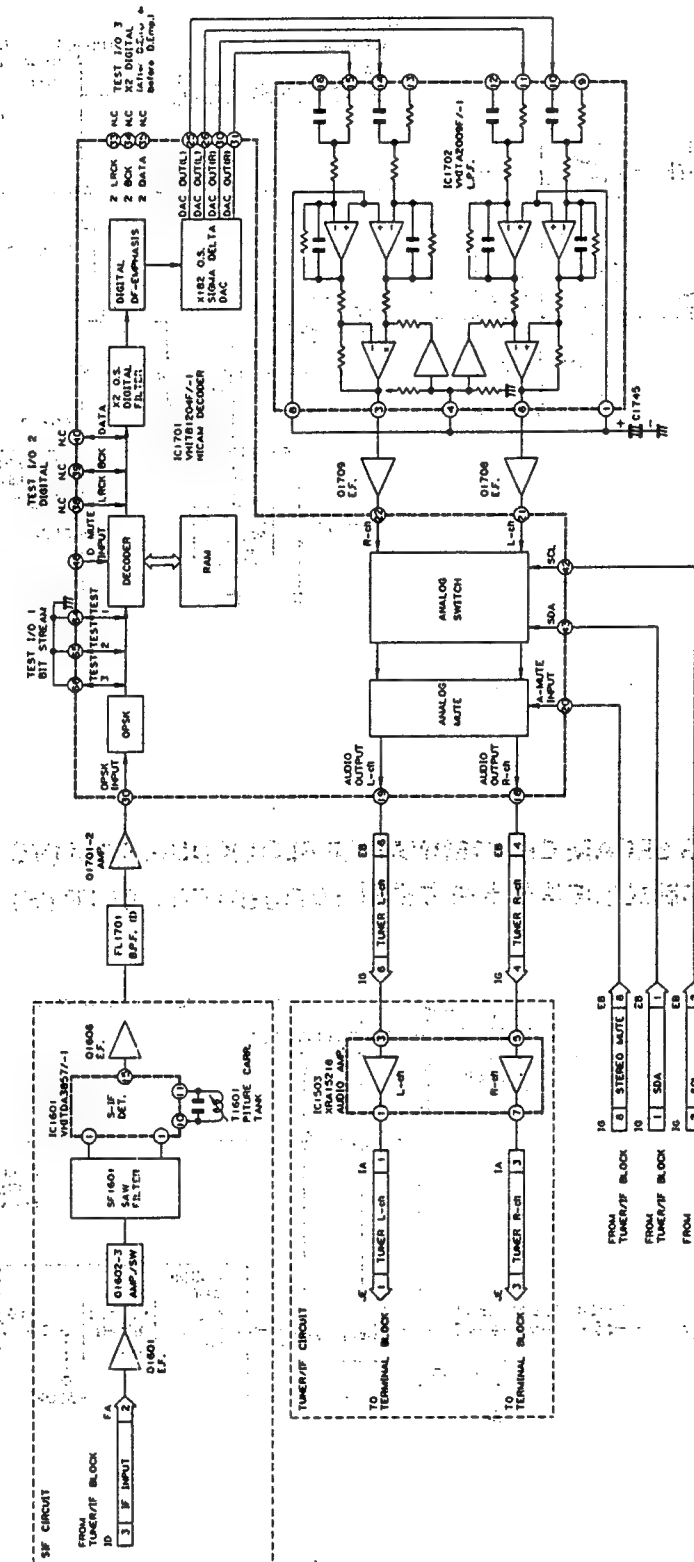
# NICAM CIRCUIT BLOCK DIAGRAM (VC-H96/VC-H96ETS)

NICAM电路方框图



# NICAM CIRCUIT BLOCK DIAGRAM (VC-H980)

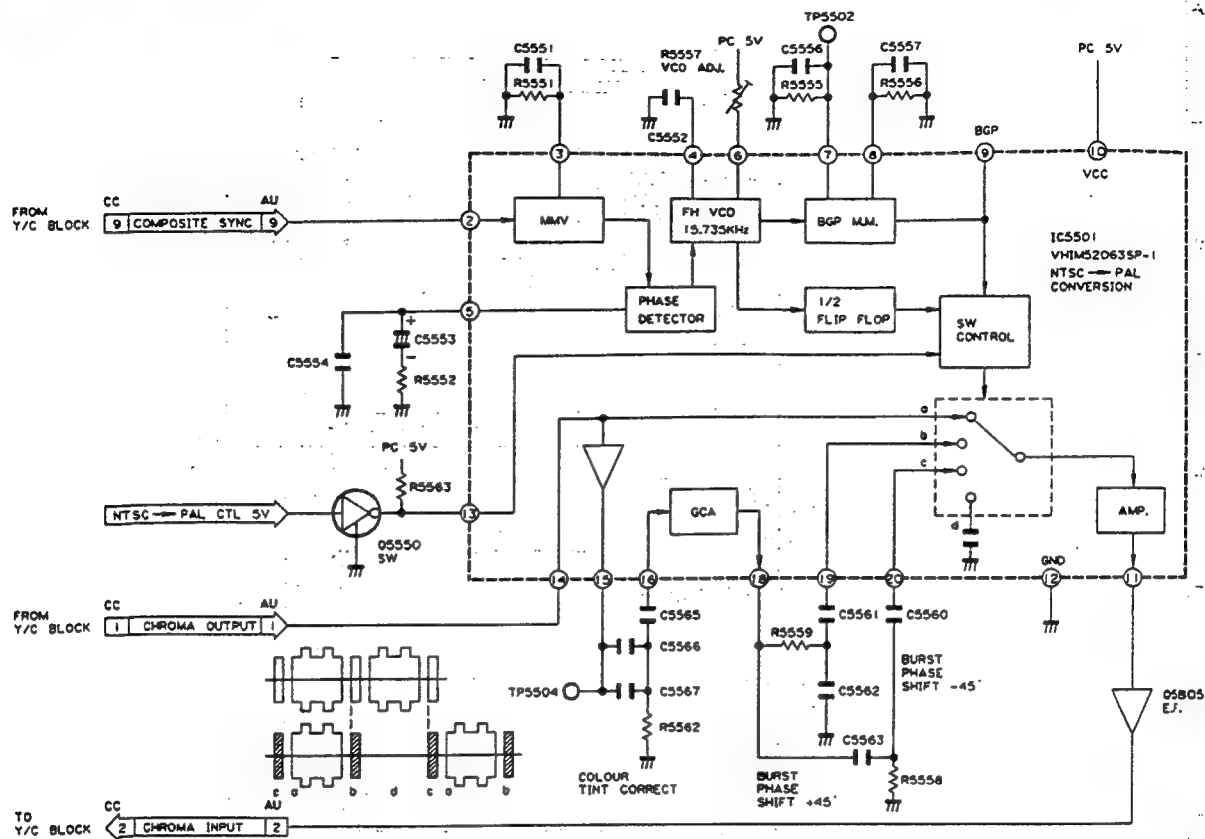
NICAM电路方框图 (VC-H980)





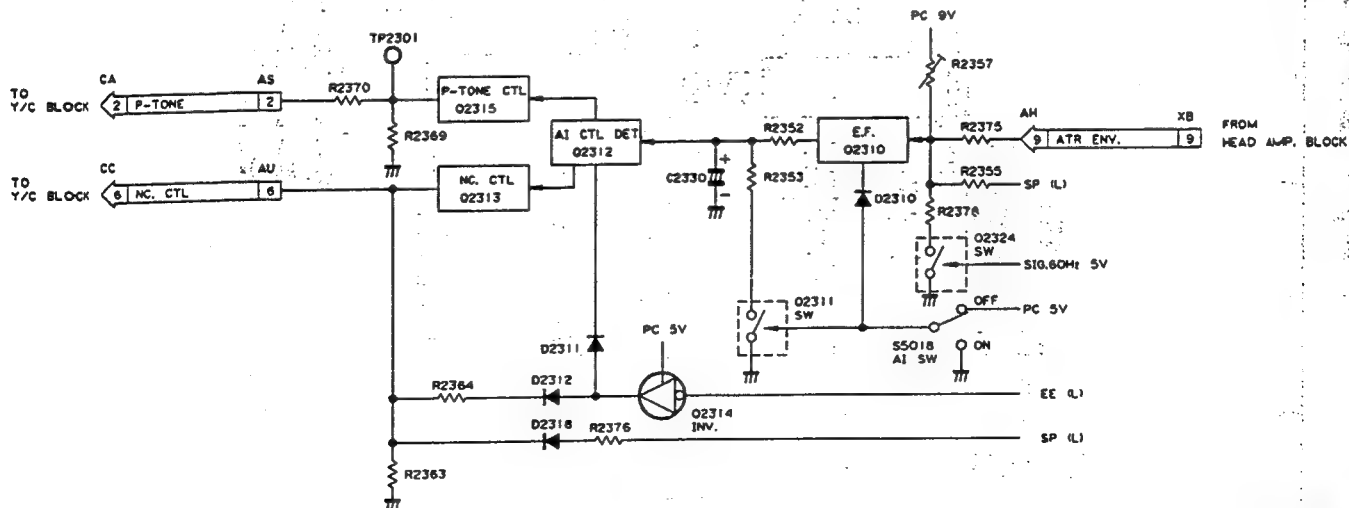
# NTSC → PAL SIMPLE CONVERSION BLOCK DIAGRAM

制式转换器(NTSC制式→PAL制式)电路的方框图

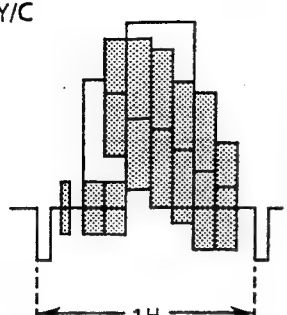
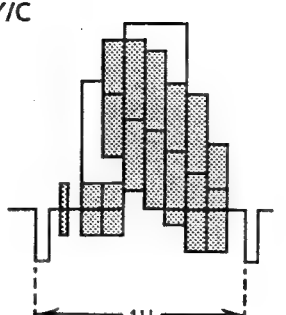
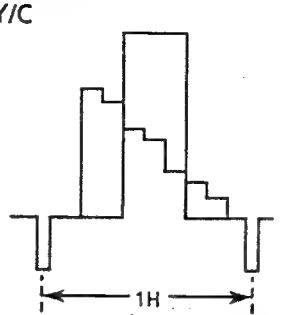
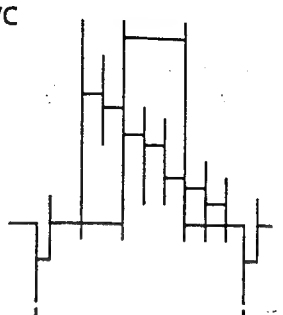
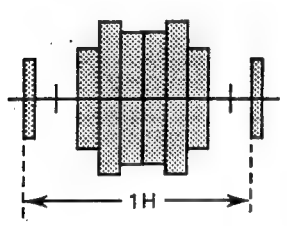
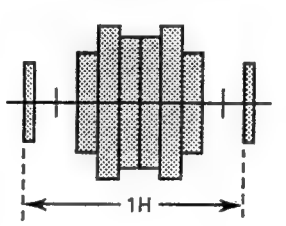
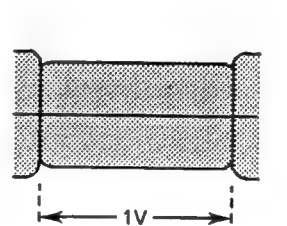
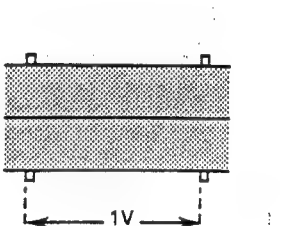
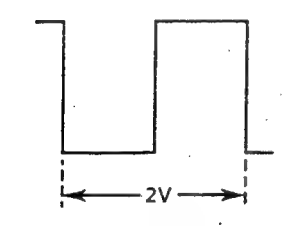
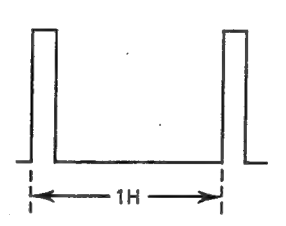
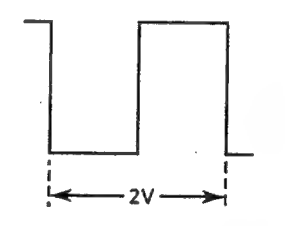
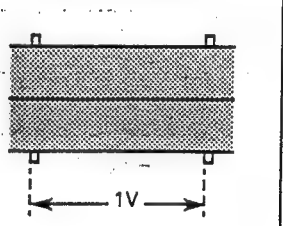
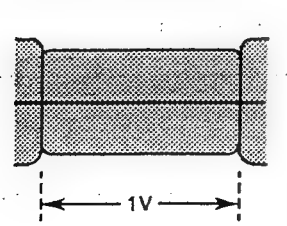
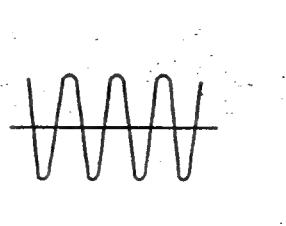
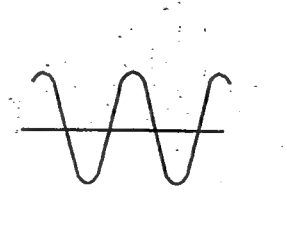
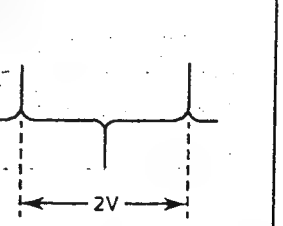


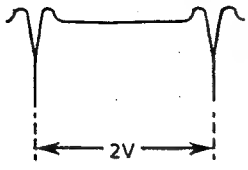
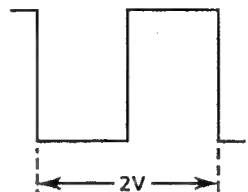
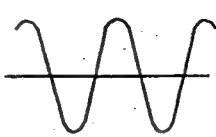
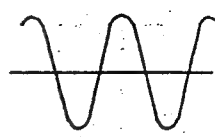
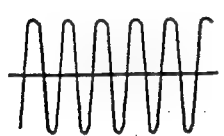
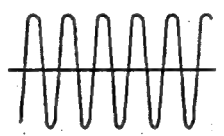
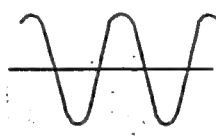
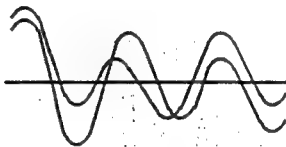
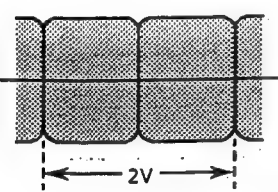
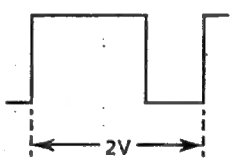
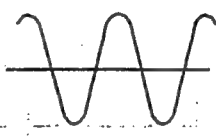
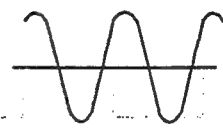
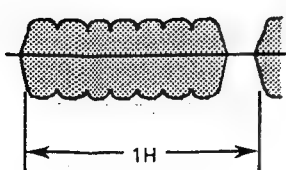
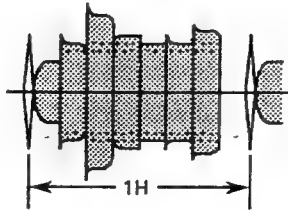
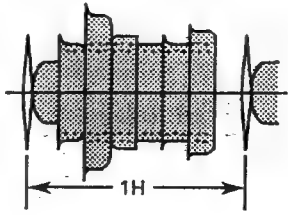
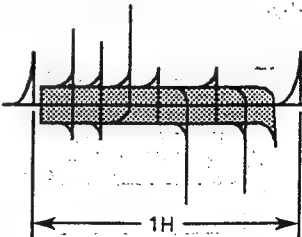
## AUTO PICTURE CONTROL BLOCK DIAGRAM

自动图象控制电路方框图



# WAVEFORMS

<p>Y/C</p>  <p>V:1.0Vp-p IC201 PIN37 REC/EE</p>	<p>Y/C</p>  <p>V:2.0Vp-p IC201 PIN34 REC/PB</p>	<p>Y/C</p>  <p>V:540mVp-p REC/EE V:550mVp-p PB IC201 PIN4</p>	<p>Y/C</p>  <p>V:500mVp-p TP201 REC/EE</p>
<p>Y/C</p>  <p>V:370mVp-p REC/EE V:100mVp-p PB IC201 PIN15</p>	<p>Y/C</p>  <p>V:350mVp-p IC201 PIN29 PB</p>	<p>Y/C</p>  <p>V:300mVp-p IC201 PIN39 PB</p>	<p>Y/C</p>  <p>V:1.0Vp-p TP203 REC</p>
<p>Y/C</p>  <p>V:1.2Vp-p IC201 PIN41 CHROMA ROTATION</p>	<p>Y/C</p>  <p>V:4.0Vp-p IC201 PIN32 COMPOSITE SYNC</p>	<p>H/A</p>  <p>V:3.6Vp-p HEAD SWITCHING PULSE AH CONNECTOR PIN4 XB CONNECTOR PIN4</p>	<p>H/A</p>  <p>V:120mVp-p (SP) V:90mVp-p (LP) XB CONNECTOR PIN2 REC AH CONNECTOR PIN2</p>
<p>H/A</p>  <p>V:220mVp-p (SP) V:180mVp-p (LP) X8 CONNECTOR PIN6 PB AH CONNECTOR PIN6</p>	<p>SERVO</p>  <p>H:760Hz (PAL SP) H:1080Hz (NTSC SP) V:1.7Vp-p AP CONNECTOR PIN6 PB/REC</p>	<p>SERVO</p>  <p>H:600Hz (PAL) H:720Hz (NTSC) V:40mVp-p AD CONNECTOR PIN4 PB/REC</p>	<p>SERVO</p>  <p>V:1.1Vp-p (SP MODE) IC702 PIN4 PB</p>

<b>SERVO</b>  H: 25Hz (PAL) V: 400mVp-p AD CONNECTOR PIN1 PB	<b>SERVO</b>  H: 25Hz (PAL) V: 4.2Vp-p IC702 PIN15 PB	<b>AUDIO</b>  H: 1kHz V: 38mVp-p IC601 PIN11 REC/EE	<b>AUDIO</b>  H: 1kHz V: 1.8Vp-p IC601 PIN24 REC
<b>AUDIO</b>  H: 70kHz $\pm$ 5kHz V: 8mVp-p TP601 (+), TP602 (-) REC	<b>AUDIO</b>  H: 70kHz $\pm$ 5kHz V: 66Vp-p T601 PIN5 REC	<b>AUDIO</b>  H: 1kHz V: 32mVp-p IC601 PIN9 PB	<b>AUDIO Hi-Fi REC FM SIGNAL</b>  H: 32 $\mu$ sec (0.2 $\mu$ sec/div) V: 32mVp-p TP6304 REC
<b>AUDIO Hi-Fi PB FM B.P.F OUTPUT</b>  H: 20msec V: 150~250mVp-p TP6303 PB	<b>AUDIO Hi-Fi HEAD SW PULSE</b>  V: 5.0Vp-p TP6305 REC/PB	<b>KEY CONTROL (VC-H980/H980ETS)</b>  V: 220mVp-p H: 1kHz IC6103 1PIN KARAOKE PB	<b>KEY CONTROL (VC-H980/H980ETS)</b>  V: 220mVp-p H: 1kHz IC6005 1PIN KARAOKE PB
<b>SECAM CHROMA</b>  V: 1.0Vp-p IC5301 PIN27 REC/EE	<b>SECAM CHROMA</b>  V: 100mVp-p Q5313 EMITTER REC/EE	<b>SECAM CHROMA</b>  V: 320mVp-p IC5301 PIN10 PB	<b>SECAM CHROMA</b>  V: 600mVp-p IC5301 PIN7 REC/EE

• **AUDIO** REC: -8dBs 1KHz INPUT SIGNAL PB: Alignment tape (VROCP5V, 1KHz Level control signal)

## SIGNAL FLOW SYMBOLS AT A GLANCE

以下用箭头解释各电路中的信号流程

<b>MAIN CIRCUIT (2) 主电路 (2)</b>	
<b>PB-C</b> → Playback Chrominance Signal 再现色度信号	<b>REC-C</b> → Recording Chrominance Signal 记录色度信号
<b>PB-Y</b> → Playback Luminance Signal 再现亮度信号	<b>REC-Y</b> → Recording Luminance Signal 记录亮度信号
<b>E-E</b> → E-E Signal (Video) (Audio) E-E信号(视频/音频)	<b>PB-C</b> → NTSC → PAL Conversion NTSC制式→PAL制式转换信号
<b>MAIN CIRCUIT (1) 主电路 (1)</b>	
<b>D-ERR</b> → Drum Error Voltage 磁鼓误差电压	<b>C-ERR</b> → Capstan Error Voltage 主导轴误差电压
<b>D-FG</b> → Drum Frequency Comparison Signal 磁鼓频率比较信号	<b>C-FG</b> → Capstan Frequency Comparison Signal 主导轴频率比较信号
<b>D-PG</b> → Drum Phase Comparison Signal 磁鼓相位比较信号	<b>PBCTL</b> → Playback Control Comparison Signal 再现控制信号
<b>MAIN CIRCUIT (3) 主电路 (3)</b>	
<b>PB-C</b> → Playback Chrominance Signal 再现色度信号	<b>PB-Y</b> → Playback Luminance Signal 再现亮度信号
<b>E-E</b> → Audio E-E Signal 音频 E-E信号	
<b>Y/C CIRCUIT Y/C(亮度/色度)电路</b>	
<b>PB-C</b> → Playback Chrominance Signal 再现色度信号	<b>REC-C</b> → Recording Chrominance Signal 记录色度信号
<b>PB-Y</b> → Playback Luminance Signal 再现亮度信号	<b>REC-Y</b> → Recording Luminance Signal 记录亮度信号
<b>E-E</b> → E-E Signal (Video) (Audio) E-E信号(视频/音频)	
<b>Hi-Fi CIRCUIT Hi-Fi(高保真)电路</b>	
<b>PB</b> → Audio Playback Signal 音频再生信号	<b>REC</b> → Audio Recording Signal 音频记录信号
<b>E-E</b> → Audio E-E Signal 音频 E-E信号	<b>GAME</b> → GAME Signal (Except VC-H91/H91ETS) 电子游戏信号(VC-H91/H91ETS除外)
<b>MIC</b> → MIC Signal (VC-H980/H980ETS) 麦克风信号(仅限于VC-H980/H980ETS)	<b>KROK</b> → KARAOKE Signal (VC-H980/H980ETS) 卡拉OK信号(仅限于VC-H980/H980ETS)
<b>TUNER/IF · JACK CIRCUIT 调谐器/中频电路图 · 插座电路</b>	
<b>PB-C</b> → Playback Chrominance Signal 再现色度信号	<b>REC-C</b> → Recording Chrominance Signal 记录色度信号
<b>PB-Y</b> → Playback Luminance Signal 再现亮度信号	<b>REC-Y</b> → Recording Luminance Signal 记录亮度信号
<b>PB</b> → Audio Playback Signal 音频再生信号	<b>REC</b> → Audio Recording Signal 音频记录信号
<b>E-E</b> → E-E Signal (Video) (Audio) E-E信号(视频/音频)	
<b>SIF · NICAM CIRCUIT (Except VC-H91/H91ETS) SIF电路 · NICAM电路</b>	
<b>E-E</b> → E-E Signal (Video/Audio) E-E信号(视频/音频)	<b>REC</b> → Audio Recording Signal 音频记录信号
<b>E-E-2</b> → 2nd E-E Signal (Video/Audio) 二次E-E信号(视频/音频)	<b>REC-2</b> → 2nd Audio Recording Signal 二次音频记录信号
<b>SECAM CHROMA CIRCUIT (VC-H91/H91ETS) SECAM色度电路</b>	
<b>REC-C</b> → Recording Chrominance Signal 记录色度信号	<b>PB-C</b> → Playback Chrominance Signal 再现色度信号
<b>HEAD AMP CIRCUIT 前置放大器电路</b>	
<b>PB-C</b> → Playback Chrominance Signal 再现色度信号	<b>REC-C</b> → Recording Chrominance Signal 记录色度信号
<b>PB-Y</b> → Playback Luminance Signal 再现亮度信号	<b>REC-Y</b> → Recording Luminance Signal 记录亮度信号
<b>PB</b> → Audio Playback Signal 音频再生信号	<b>REC</b> → Audio Recording Signal 音频记录信号



## SCHEMATIC DIAGRAM

## 电路原理图

### IMPORTANT SAFETY NOTICE:

BE SURE TO USE GENUINE PARTS FOR SECURING THE SAFETY AND RELIABILITY OF THE SET. PARTS MARKED WITH "△" AND PARTS SHADED (IN BLACK) ARE ESPECIALLY IMPORTANT FOR MAINTAINING THE SAFETY AND PROTECTING ABILITY OF THE SET. BE SURE TO REPLACE THEM WITH PARTS OF SPECIFIED PART NUMBER.

### SAFETY NOTES:

1. DISCONNECT THE AC PLUG FROM THE AC OUTLET BEFORE REPLACING PARTS.
2. SEMICONDUCTOR HEAT SINKS SHOULD BE REGARDED AS POTENTIAL SHOCK HAZARDS WHEN THE CHASSIS IS OPERATING.

### NOTES:

1. The unit of resistance "ohm" is omitted ( $k = 1000 \text{ ohm}$ ,  $M = 1 \text{ Meg ohm}$ ).
2. All resistors are  $1/8 \text{ watt}$ , unless otherwise noted.
3. The unit of capacitance "F" is omitted ( $\mu = \mu F$ ,  $P = \mu \mu F$ ).
4. The values in parentheses are the ones in the PB mode; the values without parentheses are the ones in the REC mode.

### VOLTAGE MEASUREMENT CONDITIONS:

1. DC voltages are measured between points indicated and chassis ground by VTVM, with AC110~240V/50/60Hz supplied to unit and all controls are set to normal viewing picture unless otherwise noted.
2. Voltages are measured with  $10000\mu V$  B & W or colour signal.

### WAVEFORM MEASUREMENT CONDITIONS:

$10000\mu V$  87.5 percent modulated colour bar signal is fed into tuner.

### CAUTION:

This circuit diagram is original one. Therefore there may be a slight difference from yours.

### 安全使用注意要点:

为了保证本装置的安全性及可靠性, 务请使用该型号装置的原配零件。

注有△标记, 以及打有黑色阴影线的部分, 对于保护本装置的安全, 保持其使用性能及使用寿命极其重要。

(更换这些部件时, 务请使用规定编号者。)

### 安全使用注意事项:

1. 在进行部件更换之前, 务请拔出电源插头。
2. 本装置工作时, 机芯底盘的半导体散热片有触电之虑, 务请注意。

### 电路单位说明:

1. 电阻“欧姆”(Ω)单位予以略记(K=千欧, M=兆欧姆)。
2. 除特别说明者外, 图中电阻功率均为 $1/8 \text{ 瓦特}$ 。
3. 电容“法拉”(F)单位予以略记( $\mu = \text{微法拉}$ ,  $P = \text{微微法拉}$ )。
4. 在括弧内的数值为PB状态, 无括弧的数值为REC状态。

### 电压测定条件

1. 除特别说明者外, 直流电压是以110~240V, 50/60Hz 交流电源供给本装置时, 将所有控制调节都调至正常状态后, 把VTVM(电子管电压表)连接于测点与底盘接地之间所得的读数。
2. 电压由 $10000\mu V$ 黑白或彩色信号测定。

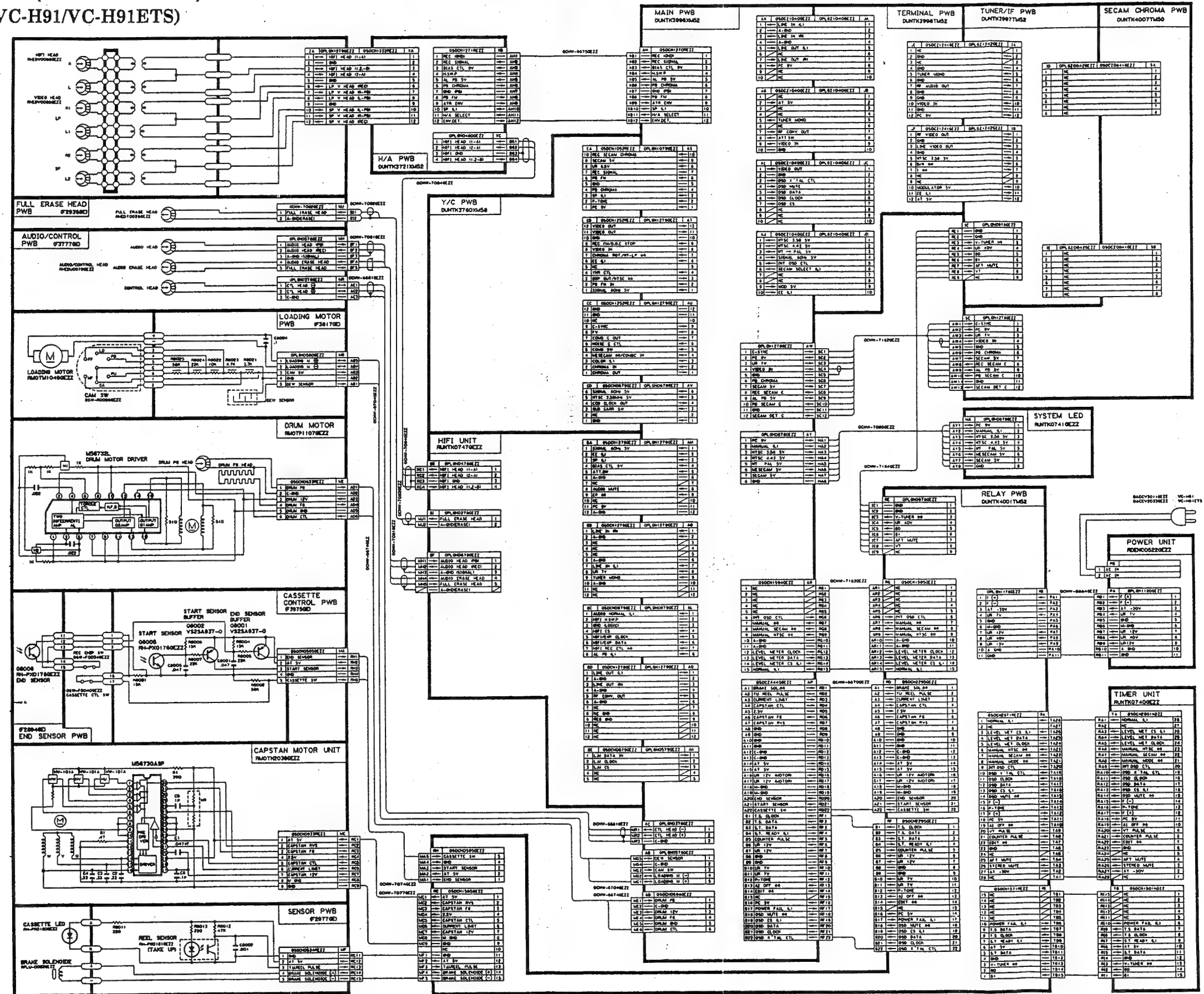
### 波形测定条件:

向调谐器输入 $10000\mu V$ 的87.5%调制色带信号的状态时进行测量。

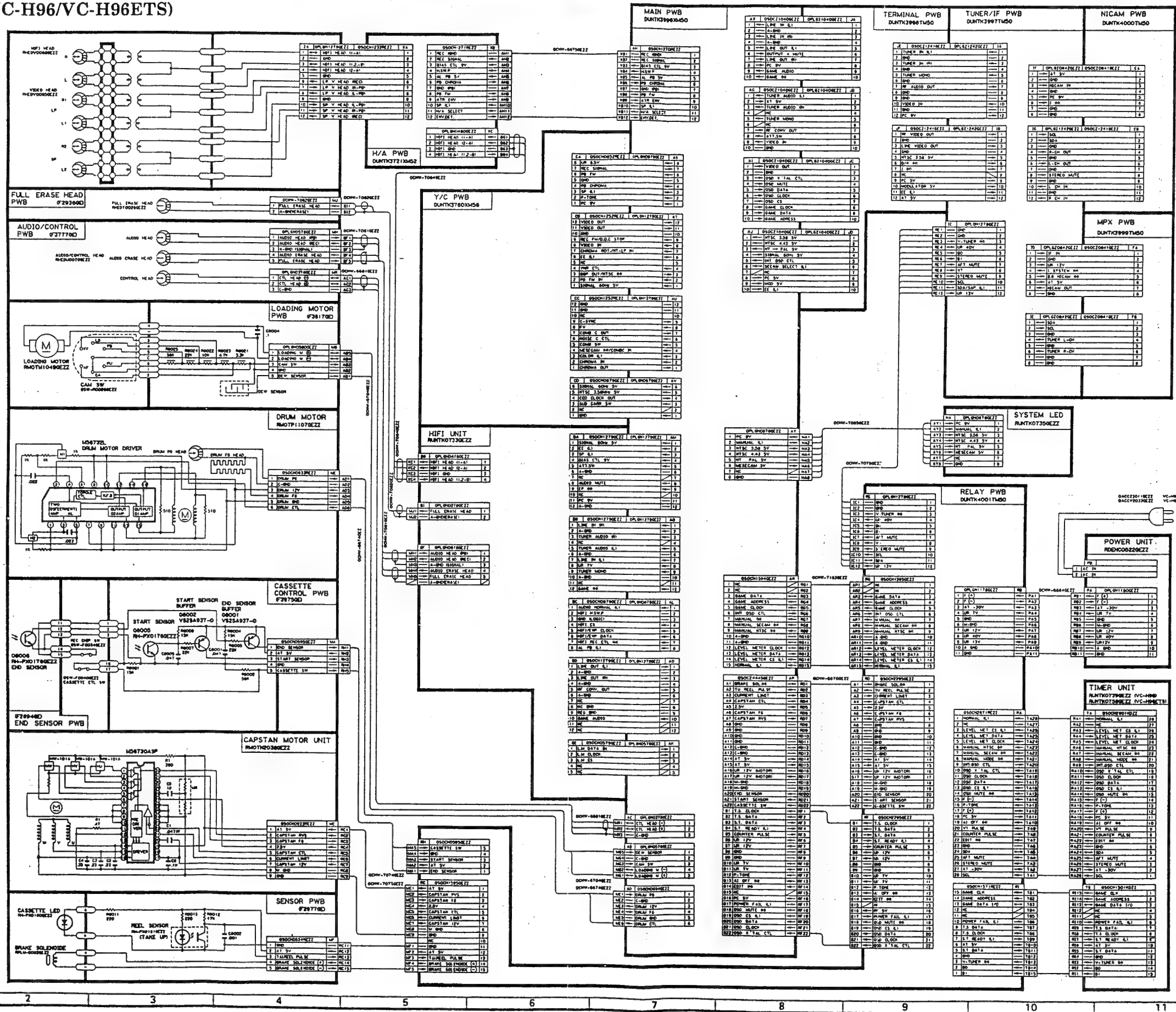
### 注意:

这里的电路原理图均为最初设计原图, 与您的机器的电路原理图可能有不同之处。

OVERALL CIRCUIT (VC-H91/VC-H91ETS)  
整机总电路 (VC-H91/VC-H91ETS)

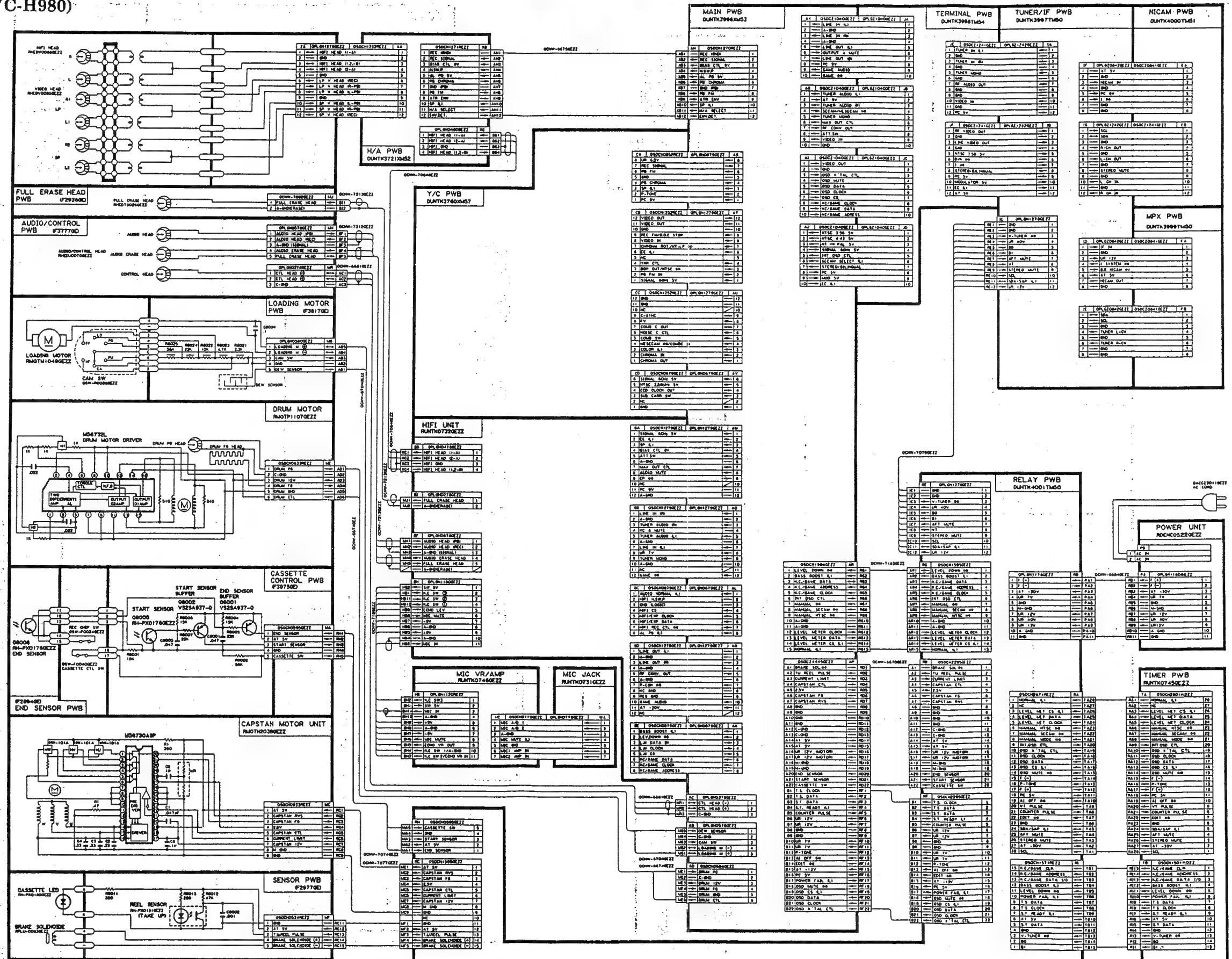


# OVERALL CIRCUIT (VC-H96/VC-H96ETS) 整机总电路 (VC-H96/VC-H96ETS)



**VC-H91/H91ETS**  
**VC-H96/H96ETS**  
**VC-H980/H980ETS**

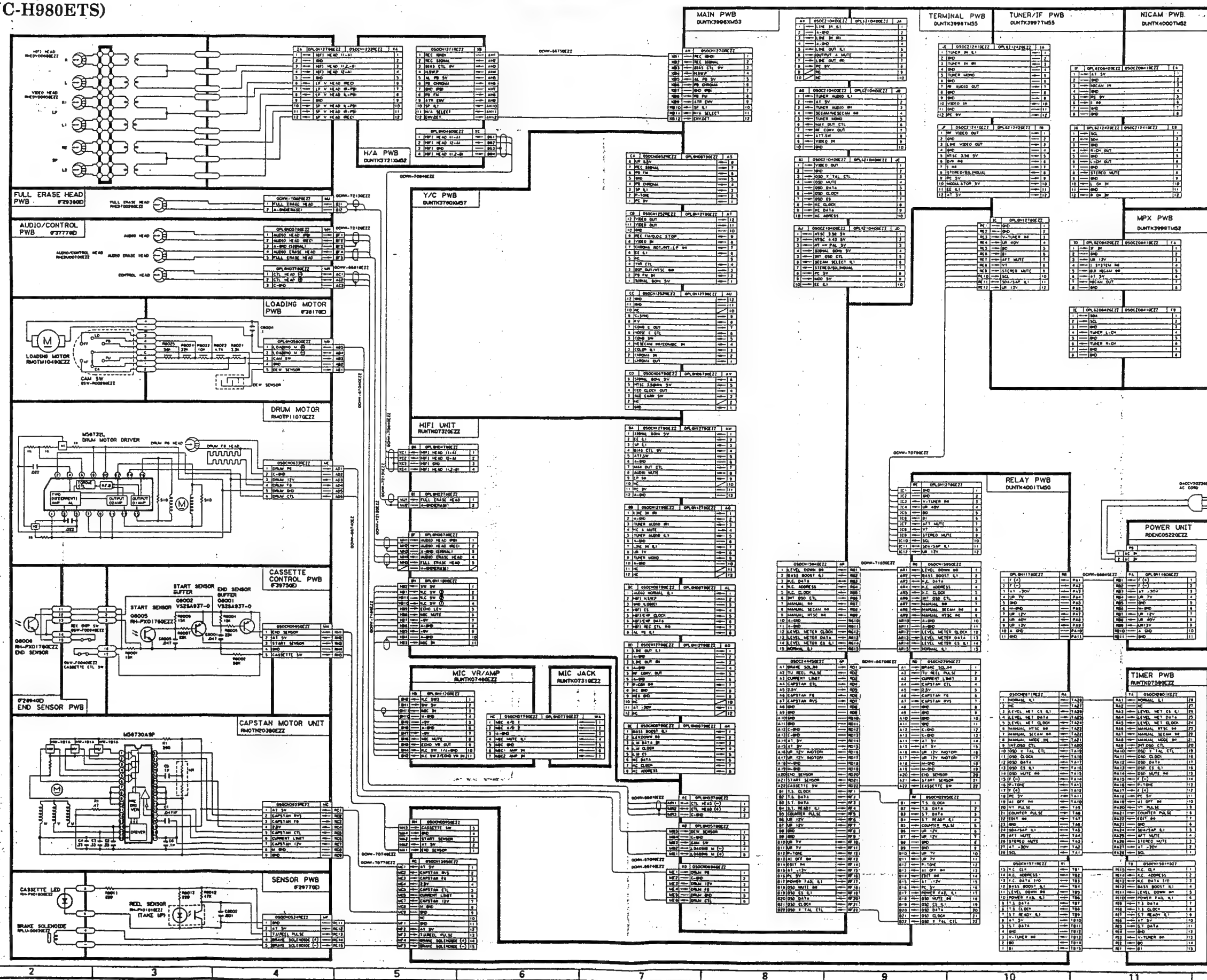
**OVERALL CIRCUIT (VC-H980)**  
**整机总电路(VC-H980)**





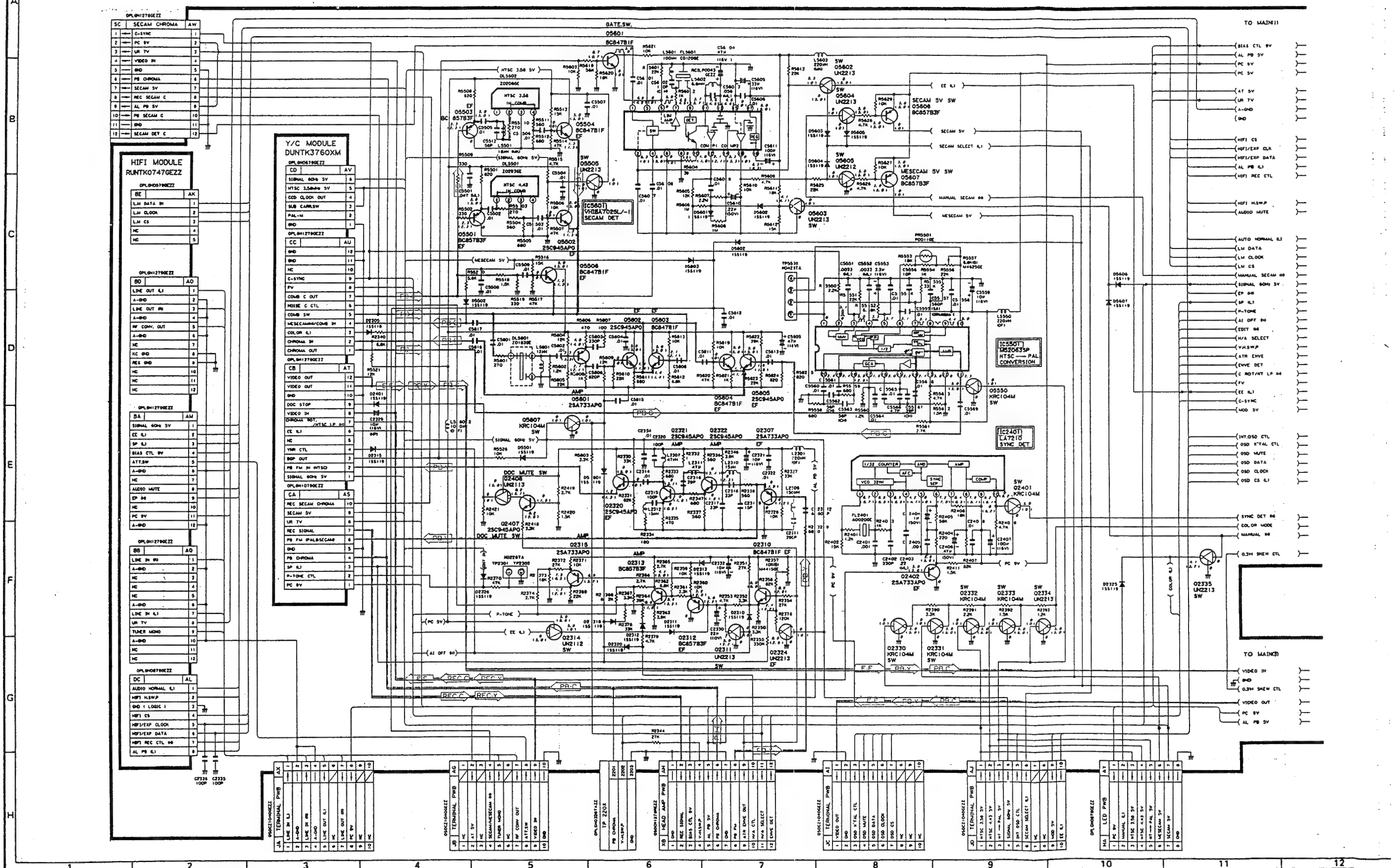
**VC-H91/H91ETS**  
**VC-H96/H96ETS**  
**VC-H980/H980ETS**

### OVERALL CIRCUIT (VC-H980ETS) 整机总电路(VC-H980ETS)



# MAIN CIRCUIT (2) (VC-H91/VC-H91ETS)

## 主电路 (2) (VC-H91/VC-H91ETS)



\* VOLTAGE MEASUREMENT MODE

电压测量数值

PB ..... Parentheses ( )

再现: 括弧内的数值

以表: 于该表的数值

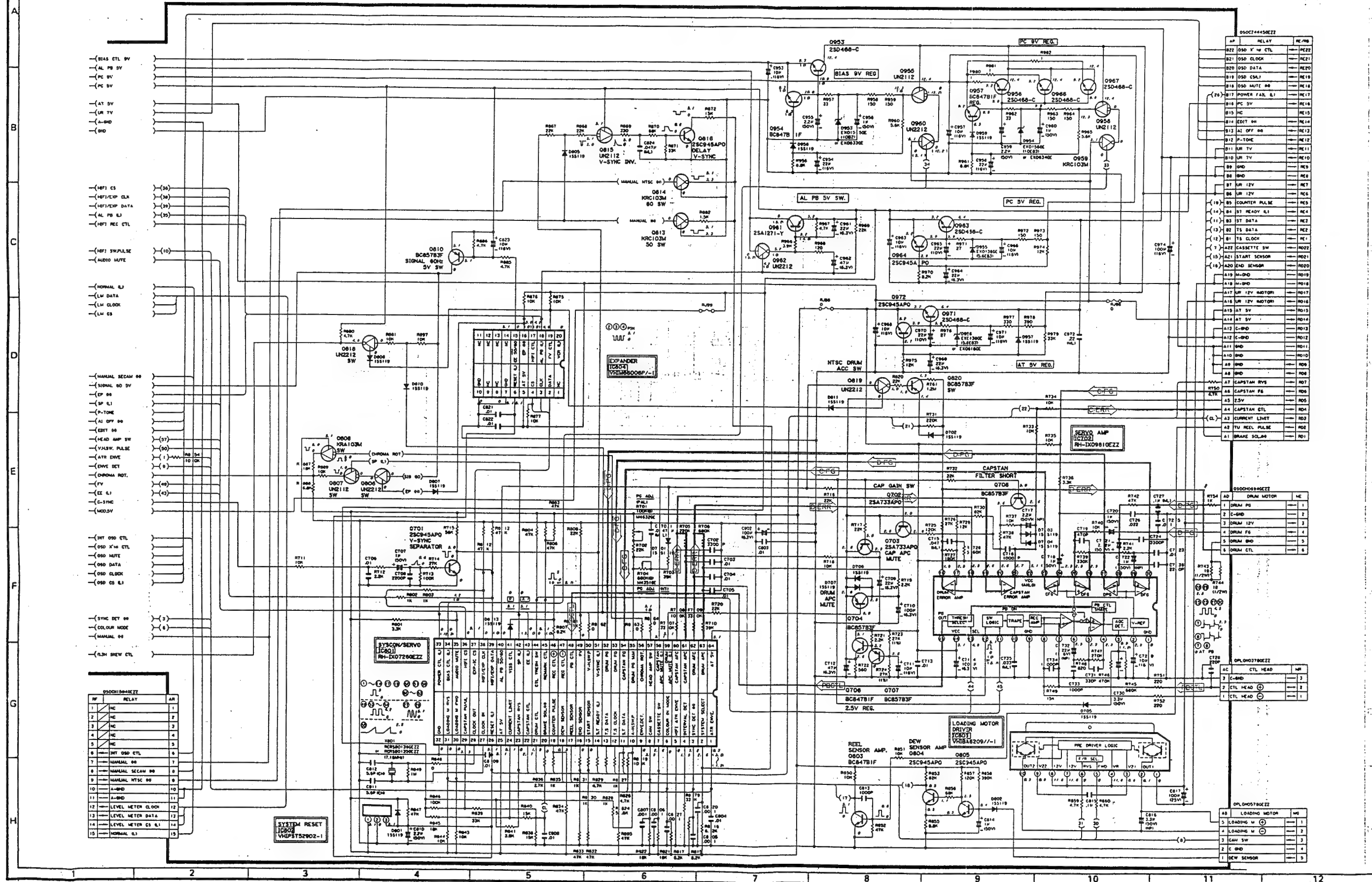








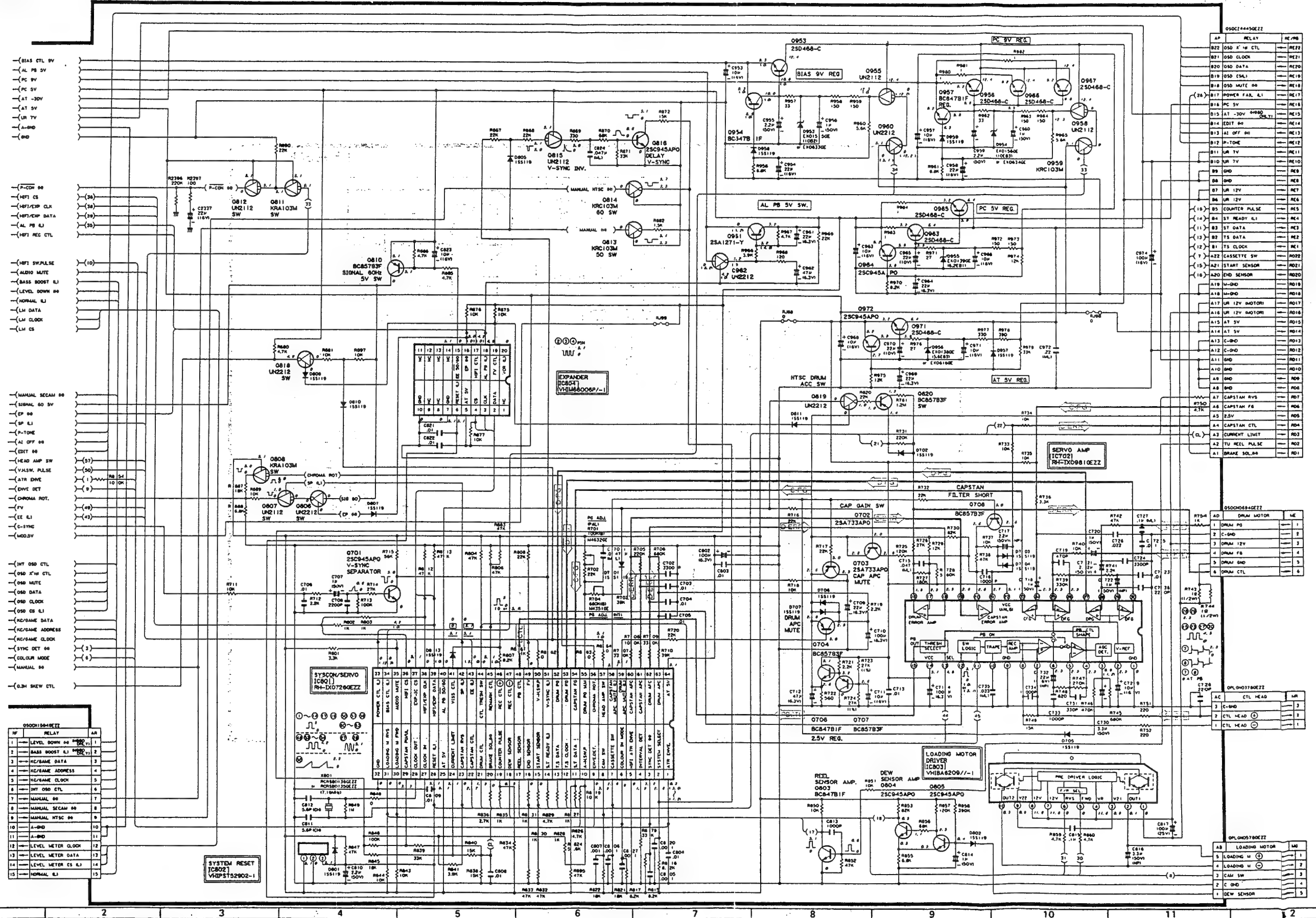
# MAIN CIRCUIT (1) (VC-H91/VC-H91ETS) 主电路 (1) (VC-H91/VC-H91ETS)



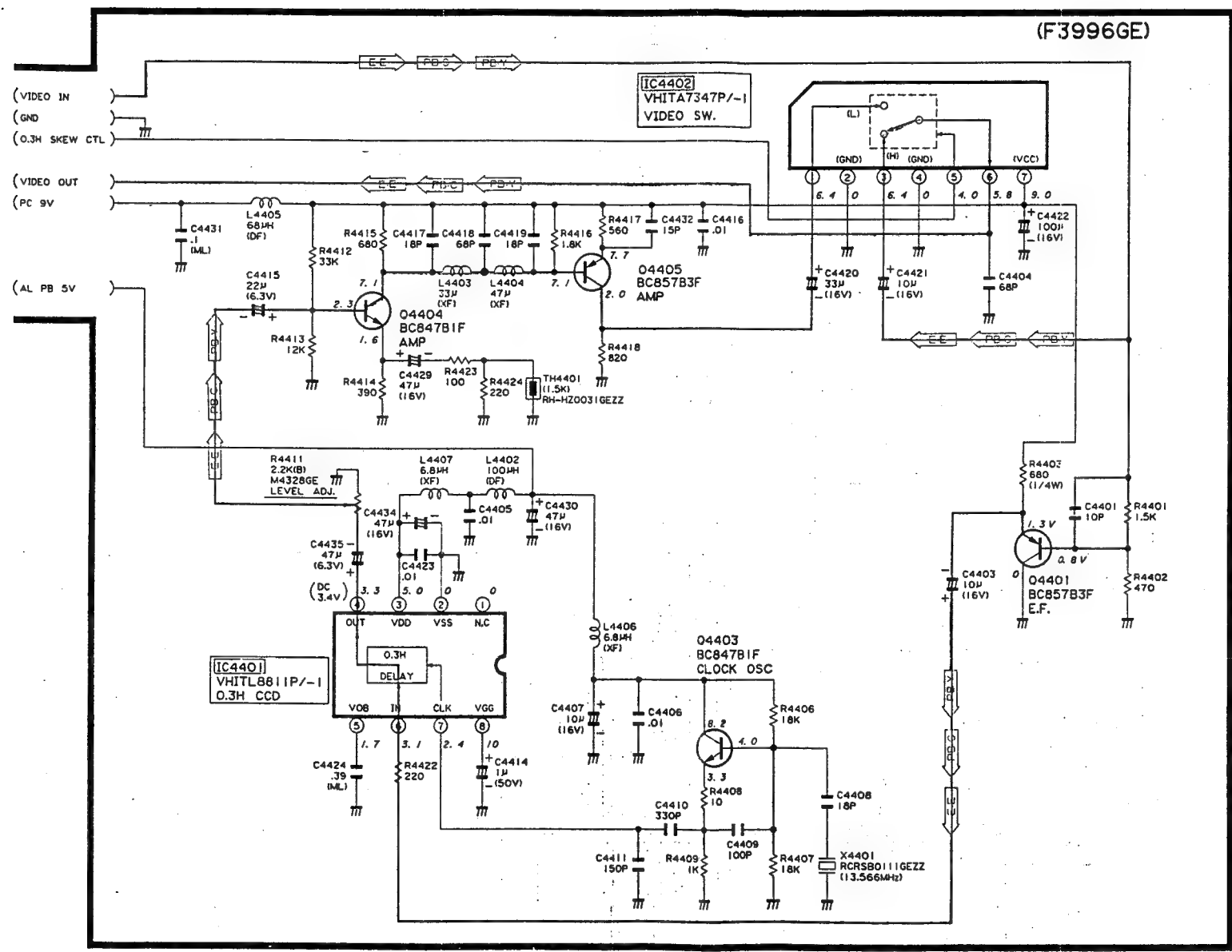
• VOLTAGE MEASUREMENT MODE  
PB ..... Parentheses ( )  
REC ..... Without Parentheses

• 电压测量数值  
再现: 括弧内的数值  
记录: 无括弧的数值

**MAIN CIRCUIT (1) (VC-H96/VC-H96ETS/VC-H980/VC-H980ETS)**  
**主电路 (1) (VC-H96/VC-H96ETS/VC-H980/VC-H980ETS)**



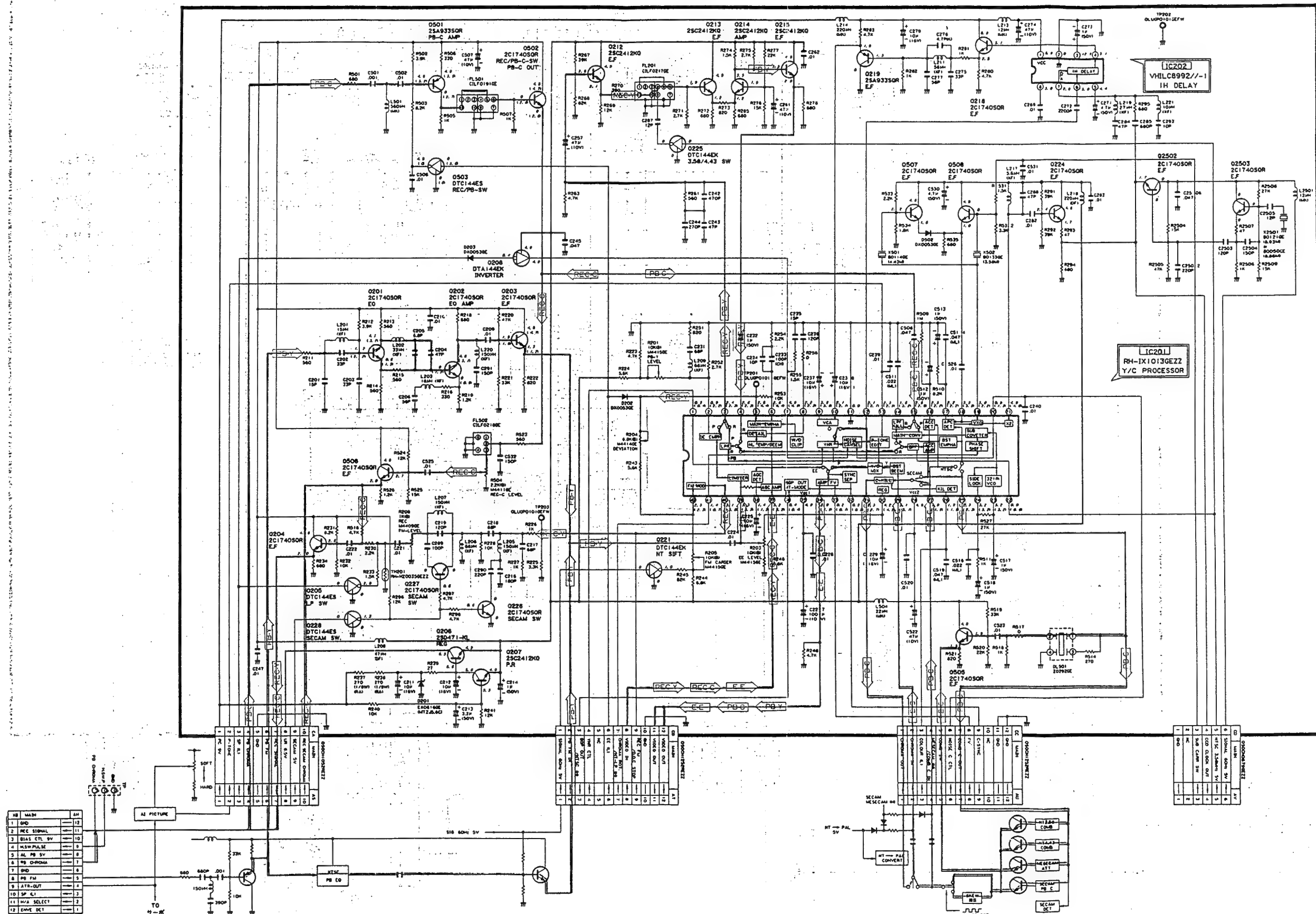
MAIN CIRCUIT (3)  
主电路 (3)



VC-H91/H91ETS      VC-H91/H91ETS  
VC-H96/H96ETS      VC-H96/H96ETS  
VC-H980/H980ETS    VC-H980/H980ETS

### Y/C CIRCUIT (VC-H91/VC-H91ETS)

### Y/C(亮度/色度)电路(VC-H91/VC-H91ETS)



\* VOLTAGE MEASUREMENT MODE

**PB** ..... Parentheses ( )

### ● 电压测量数值

再现：括弧内的数值

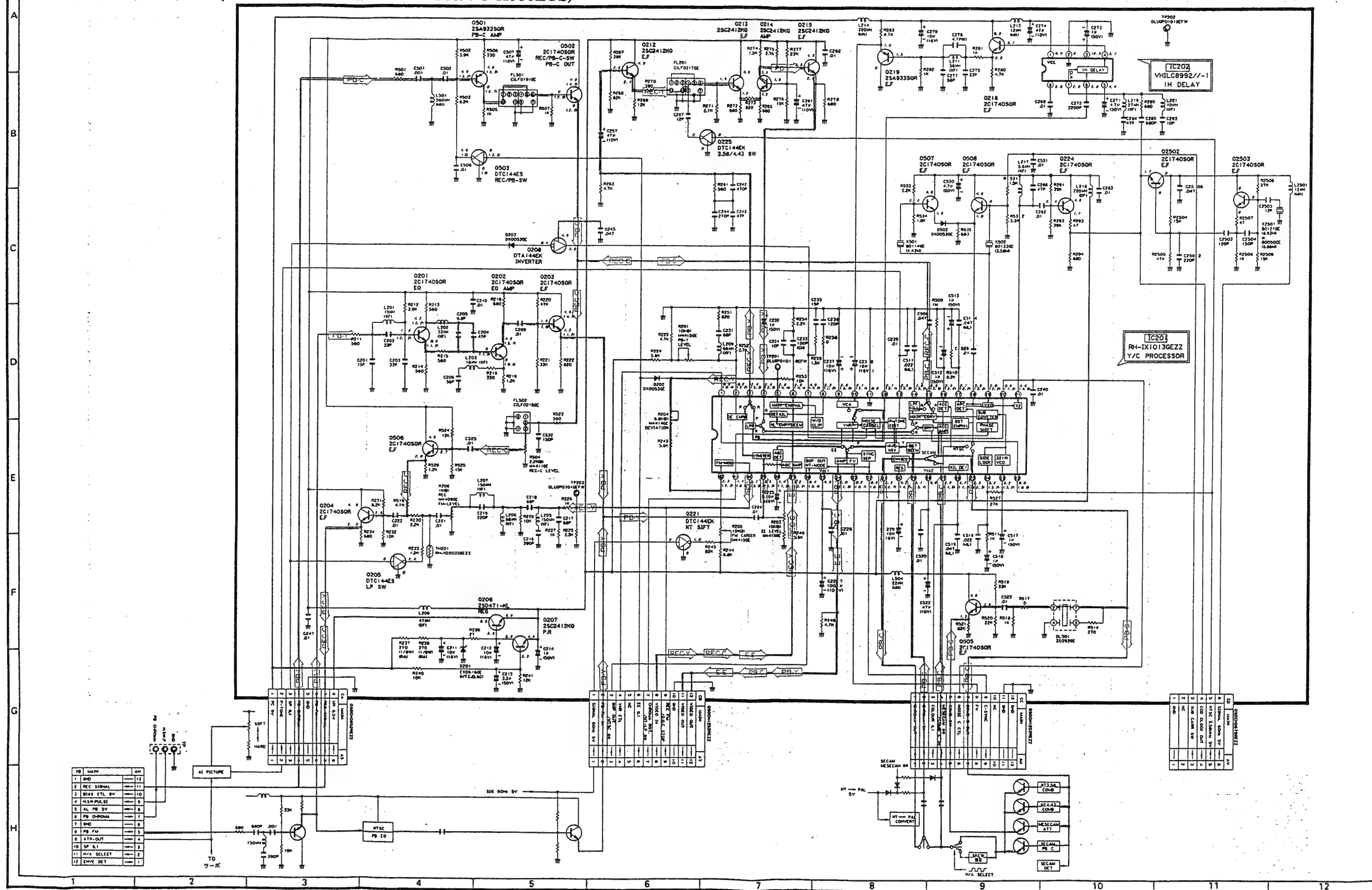
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VC-H91/H91ETS VC-H91/H91ETS  
VC-H96/H96ETS VC-H96/H96ETS  
VC-H980/H980ETS VC-H980/H980ETS

Y/C(亮度/色度)电路 (VC-H96/VC-H96ETS/VC-H980/VC-H980ETS)



### ● 电压测量数值

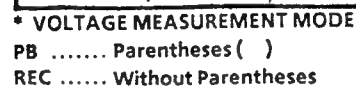
再現：括弧内の数値

记录：无括弧的数值

205

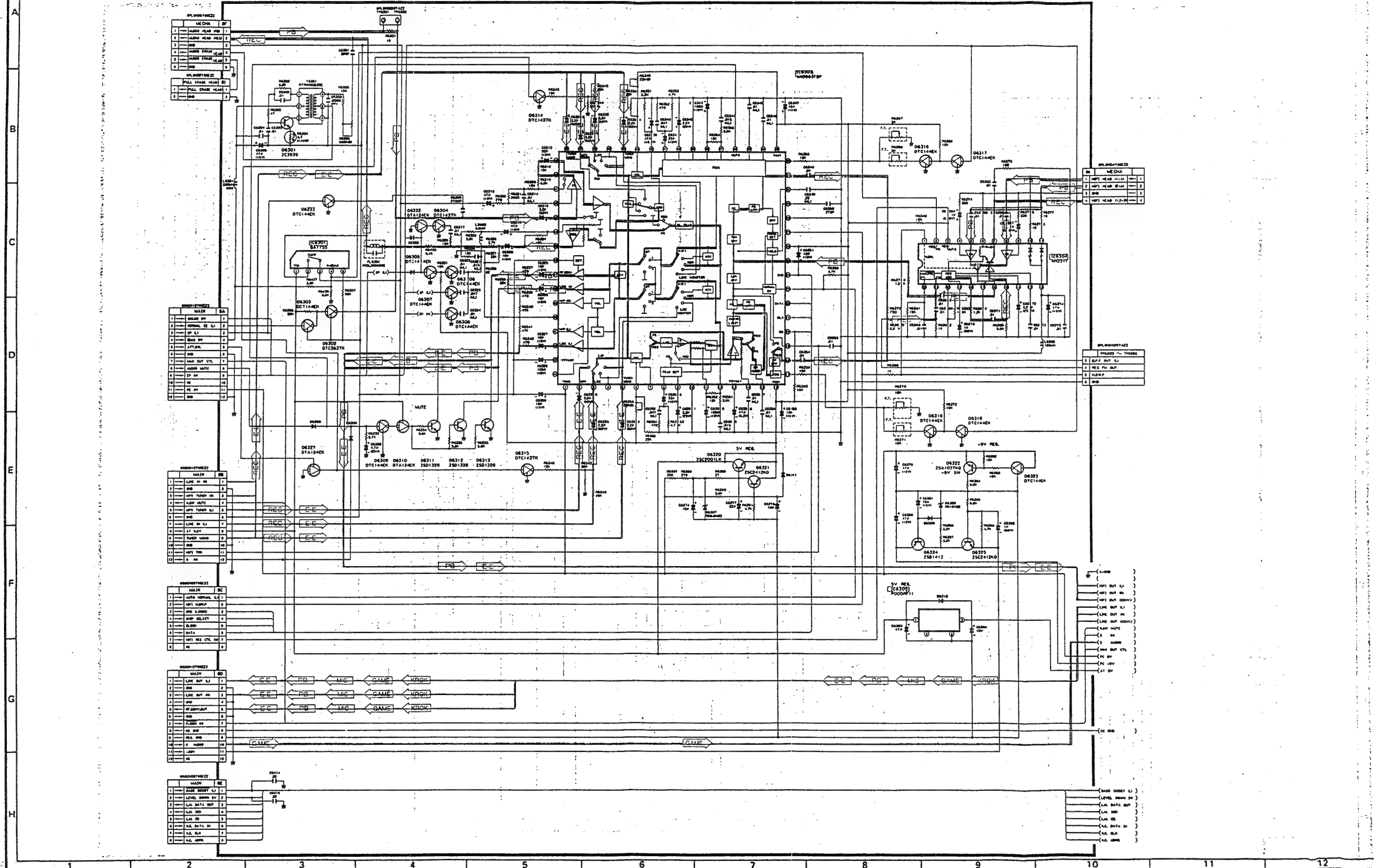
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### Hi-Fi(高保真)电路 (VC-H91/VC-H91ETS)



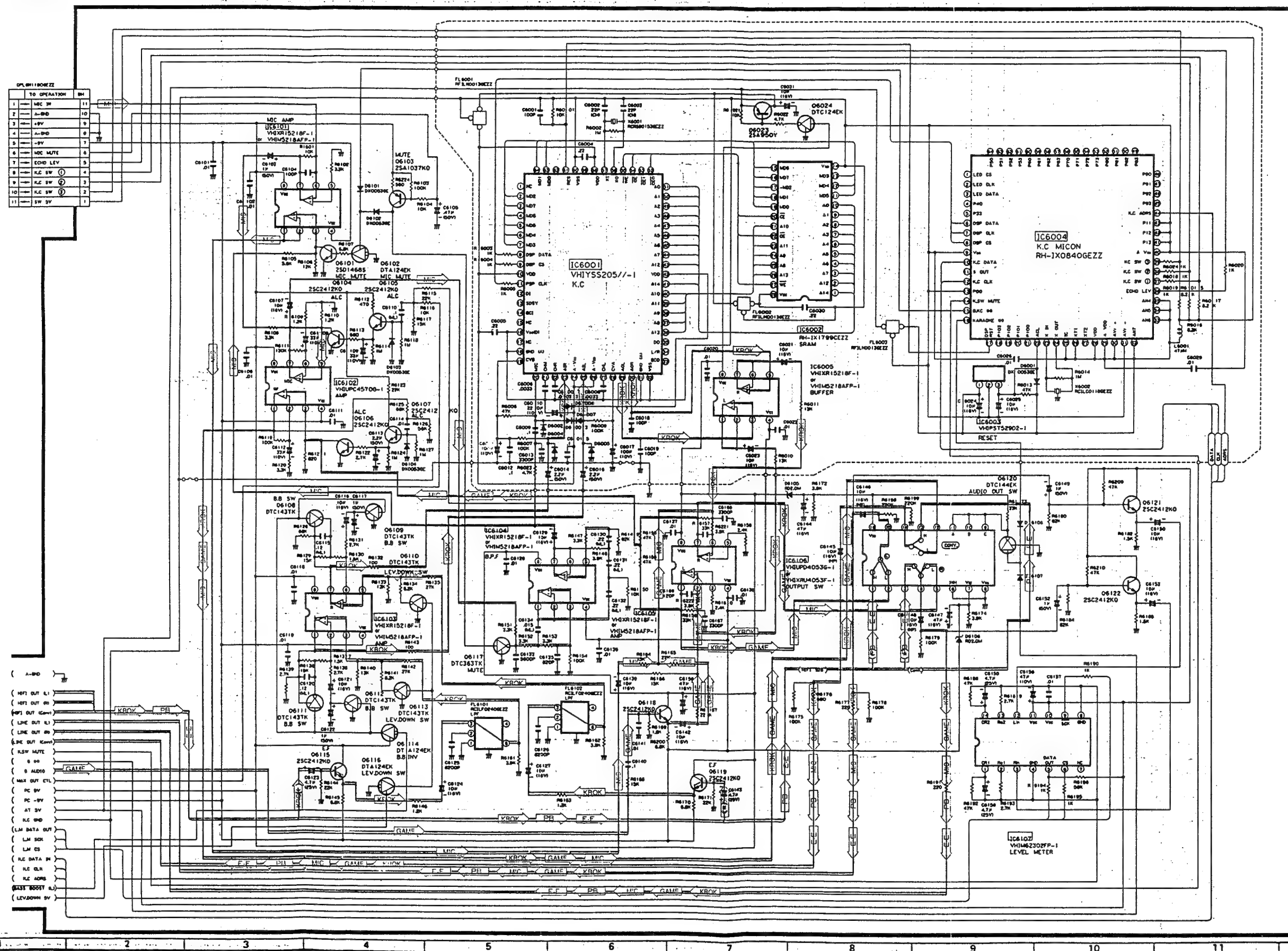


Hi-Fi CIRCUIT (1) (VC-H980/VC-H980ETS)  
Hi-Fi(高保真)电路 (1) (VC-H980/VC-H980ETS)



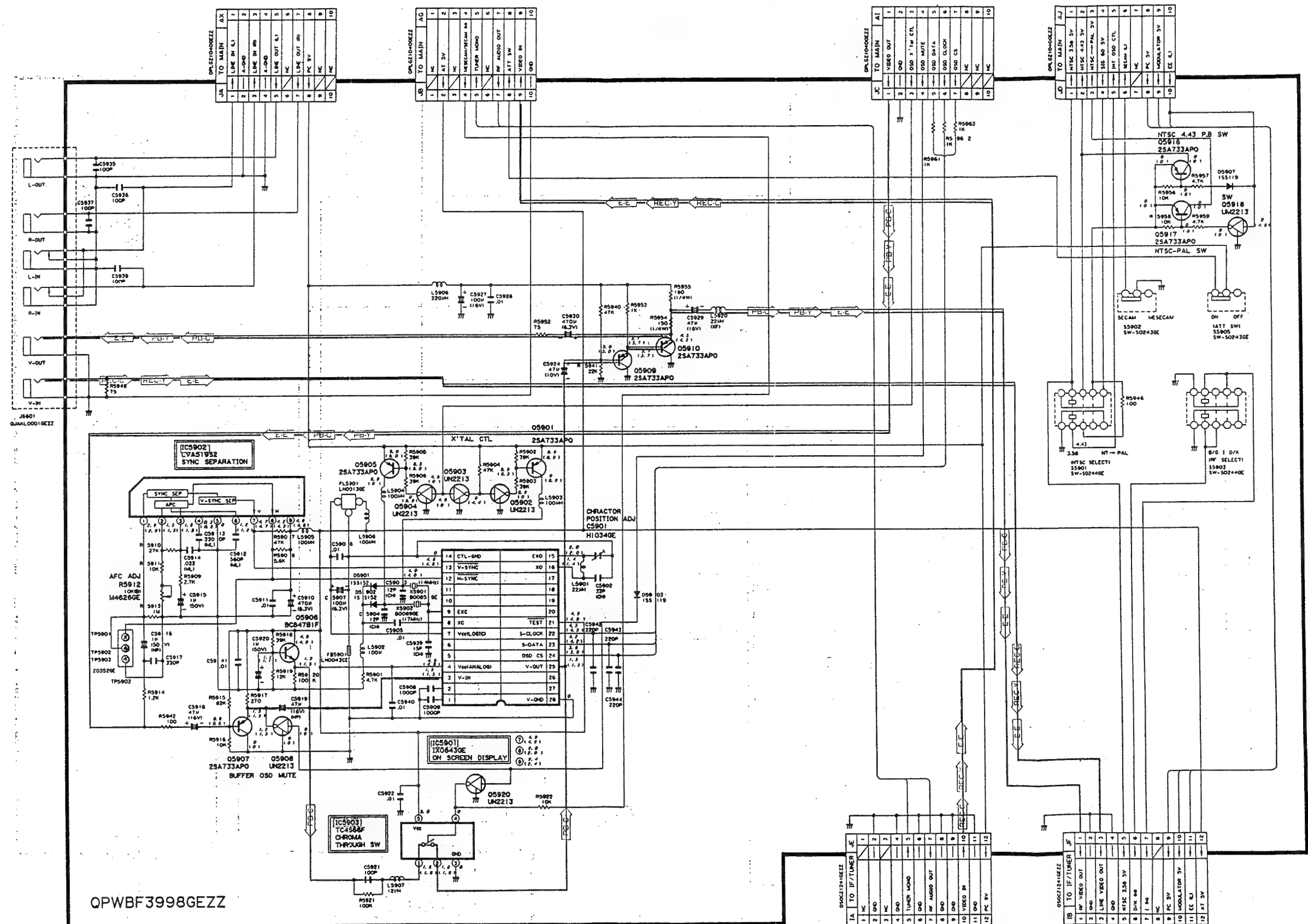


Hi-Fi CIRCUIT (2) (VC-H980/VC-H980ETS)  
Hi-Fi(高保真)电路(2)(VC-H980/VC-H980ETS)



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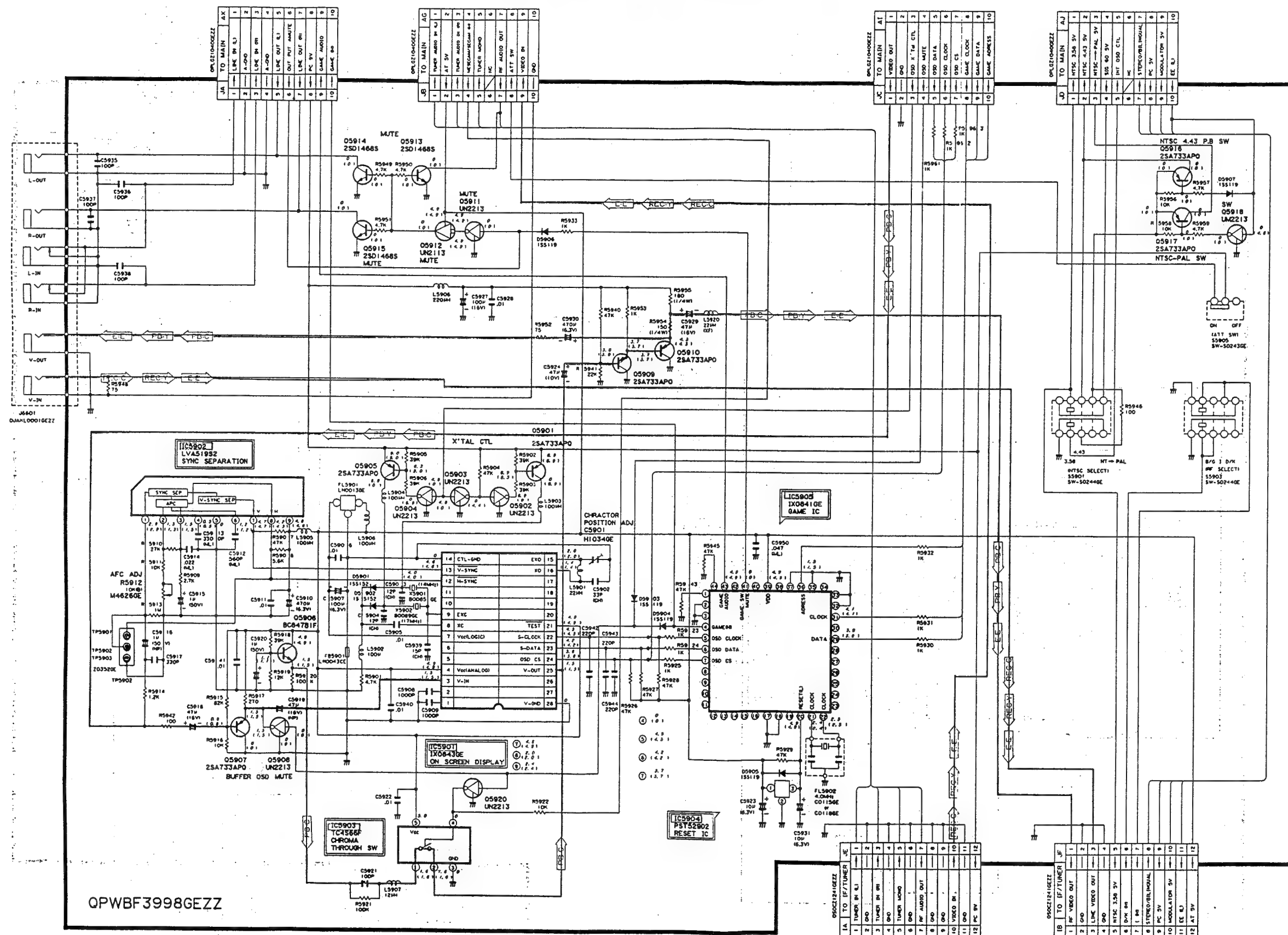
TERMINAL CIRCUIT (VC-H91/VC-H91ETS)  
终端电路 (VC-H91/VC-H91ETS)



QPWBF3998GEZZ

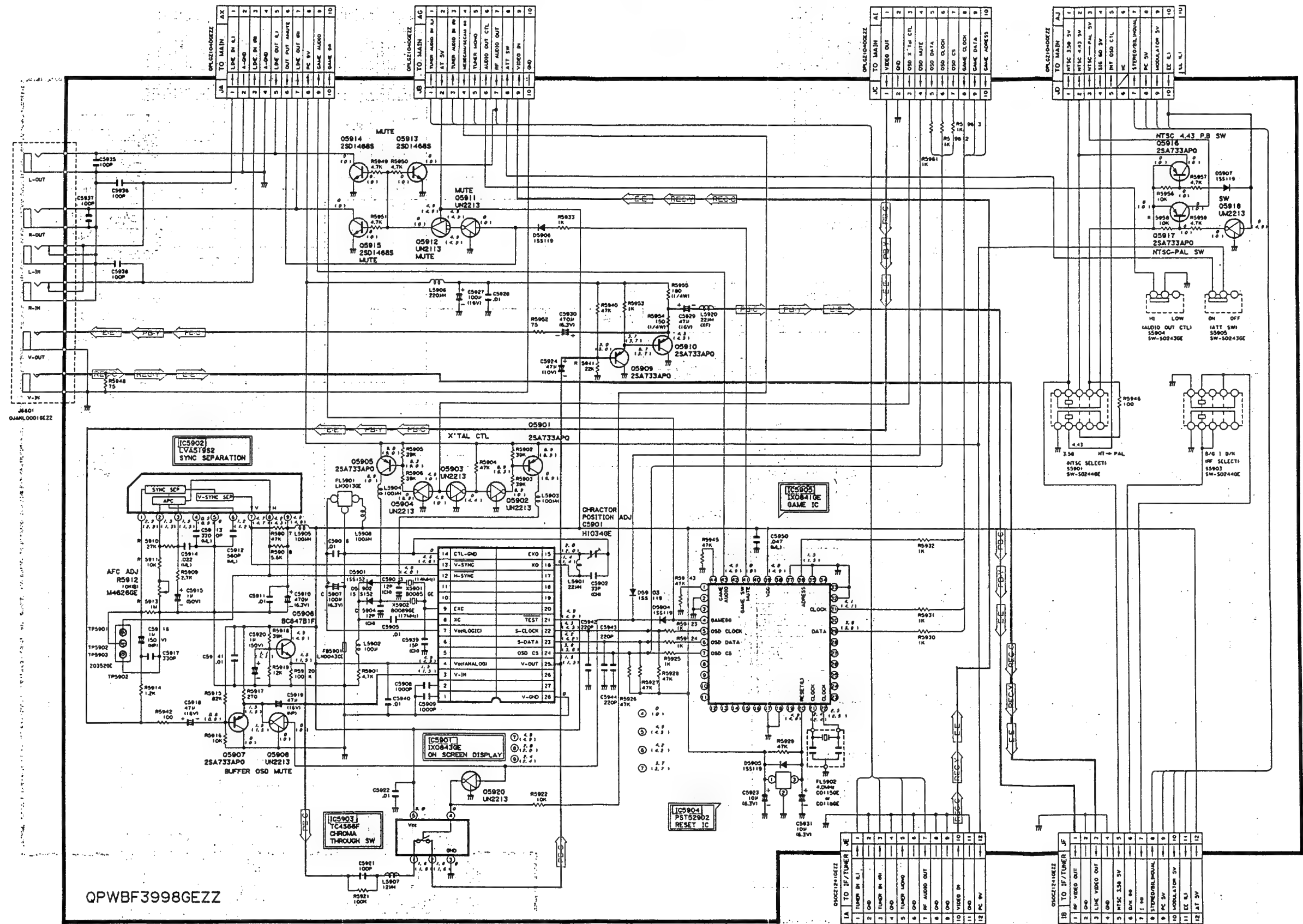
**VC-H91/H91ETS**  
**VC-H96/H96ETS**  
**VC-H980/H980ETS**

### TERMINAL CIRCUIT (VC-H96/VC-H96ETS) 终端电路 (VC-H96/VC-H96ETS)



●电压测量数值  
再现：括弧内的数值  
记录：无括弧的数值

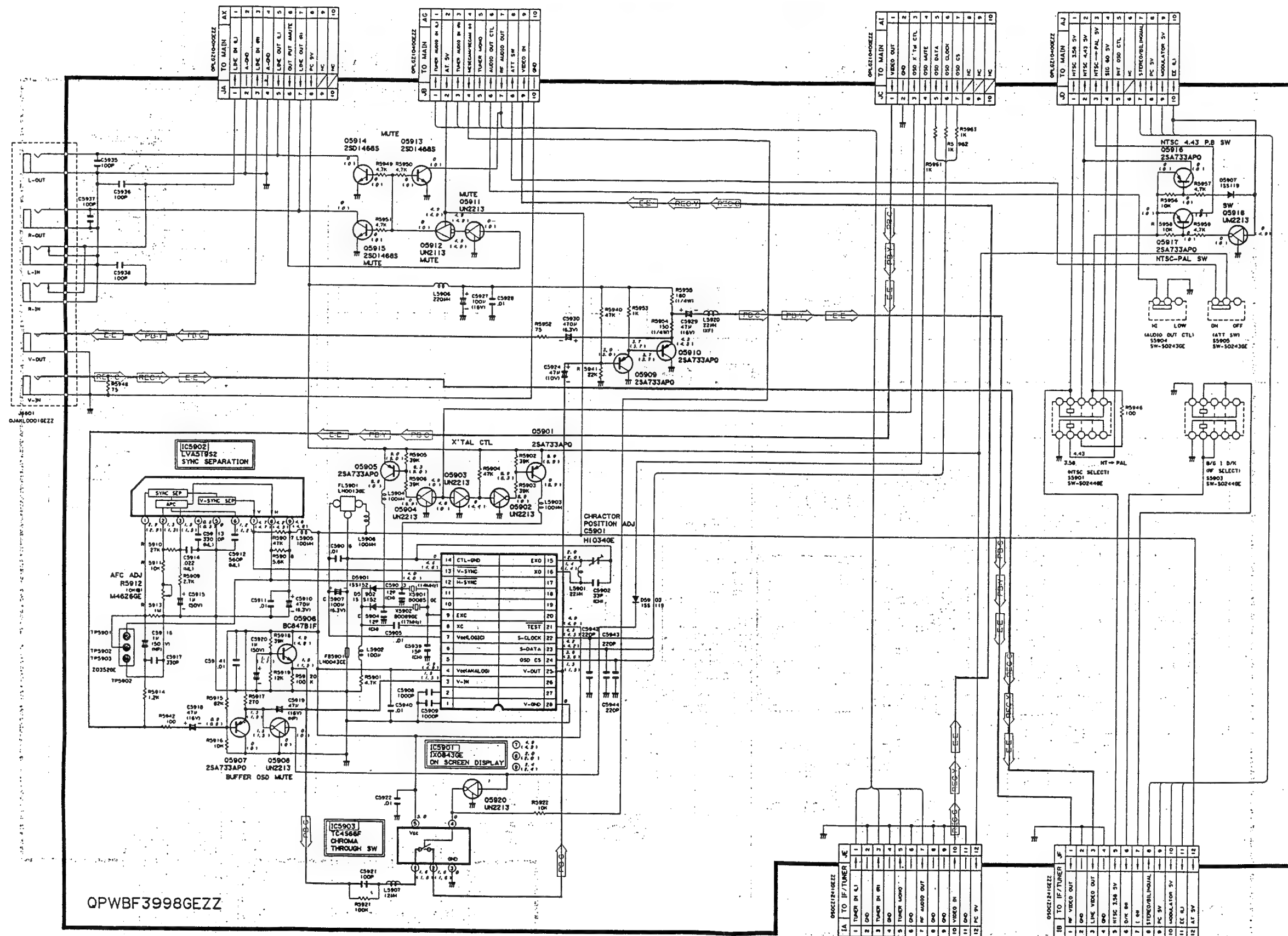
TERMINAL CIRCUIT (VC-H980)  
终端电路 (VC-H980)



QPWBF3998GEZZ



TERMINAL CIRCUIT (VC-H980ETS)  
终端电路 (VC-H980ETS)



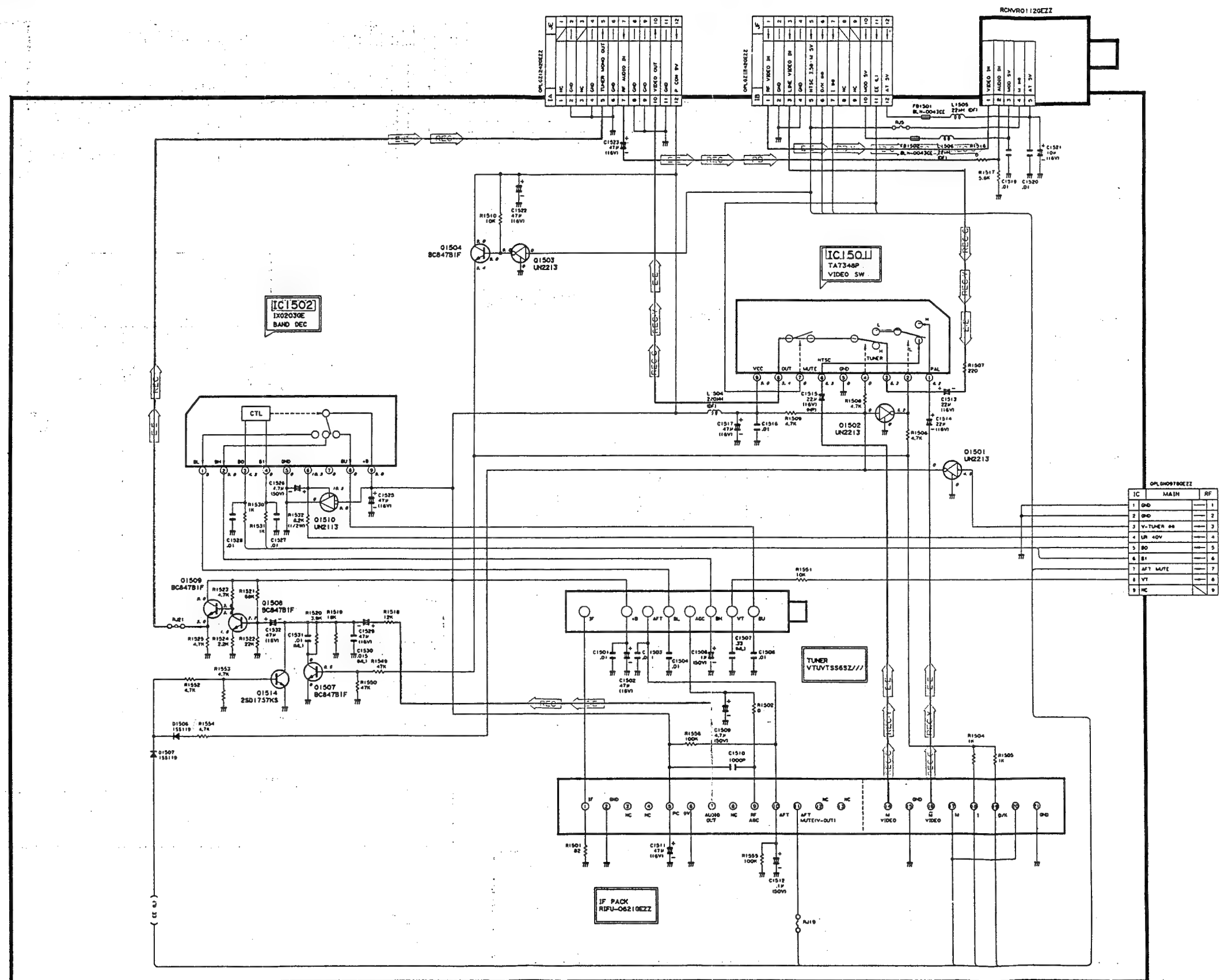
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VOLTAGE MEASUREMENT MODE  
B ..... Parentheses ( )  
EC ..... Without Parentheses

电压测量数值  
再现：括弧内的数值  
记录：无括弧的数值

VC-H91/H91ETS      VC-H91/H91ETS  
VC-H96/H96ETS      VC-H96/H96ETS  
VC-H980/H980ETS    VC-H980/H980ETS

**TUNER/IF CIRCUIT (VC-H91/VC-H91ETS)**  
**调谐器/中频电路图 (VC-H91/VC-H91ETS)**



\* VOLTAGE MEASUREMENT MODE  
PB ..... Parentheses ( )  
PFC ..... Without Parentheses

- 电压测量数值
  - 再现：括弧内的数值
  - 记录：无括弧的数值

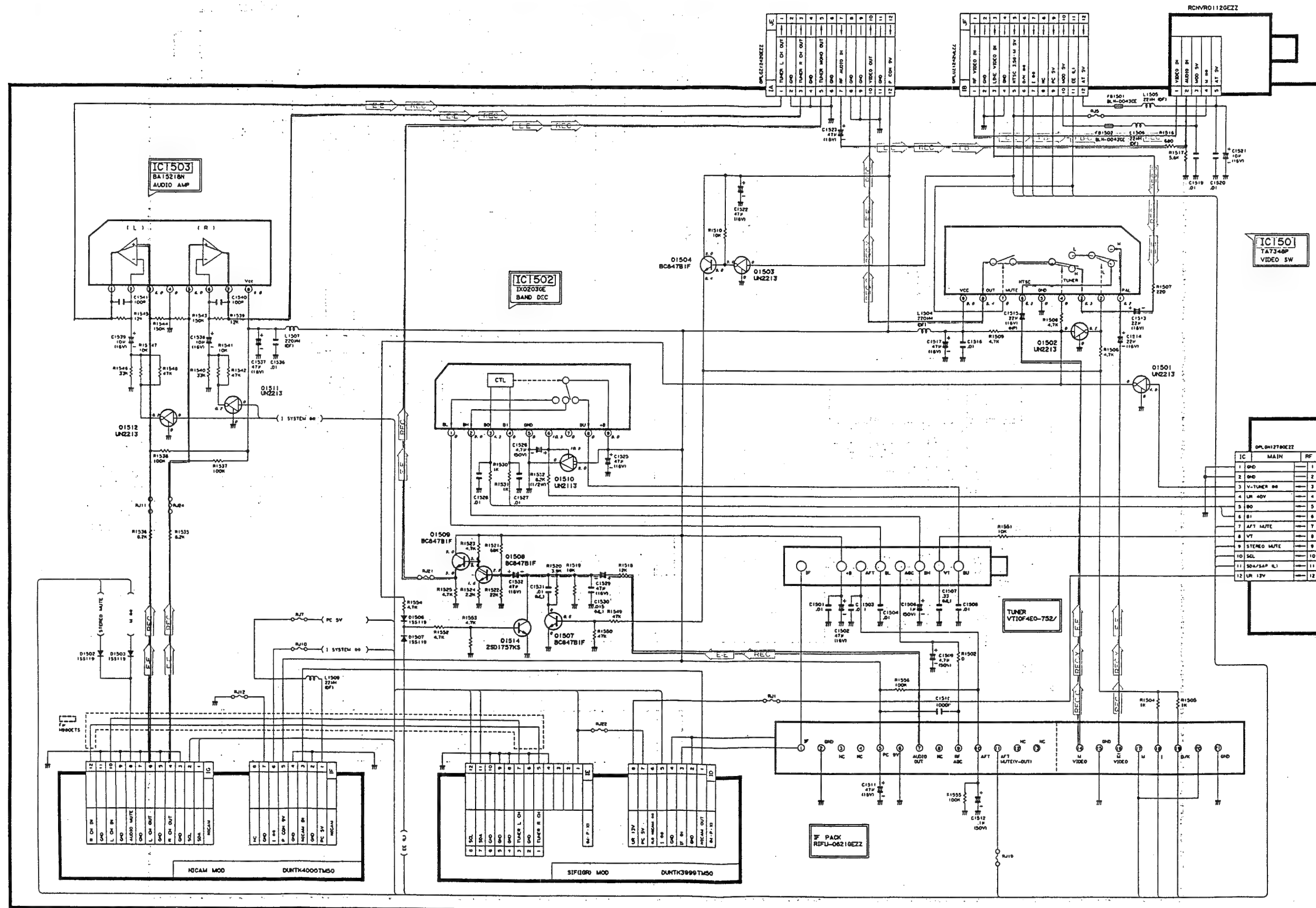
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VC-H91/H91ETS  
VC-H96/H96ETS  
VC-H980/H980ETS

VC-H91/H91ETS  
VC-H96/H96ETS  
VC-H980/H980ETS

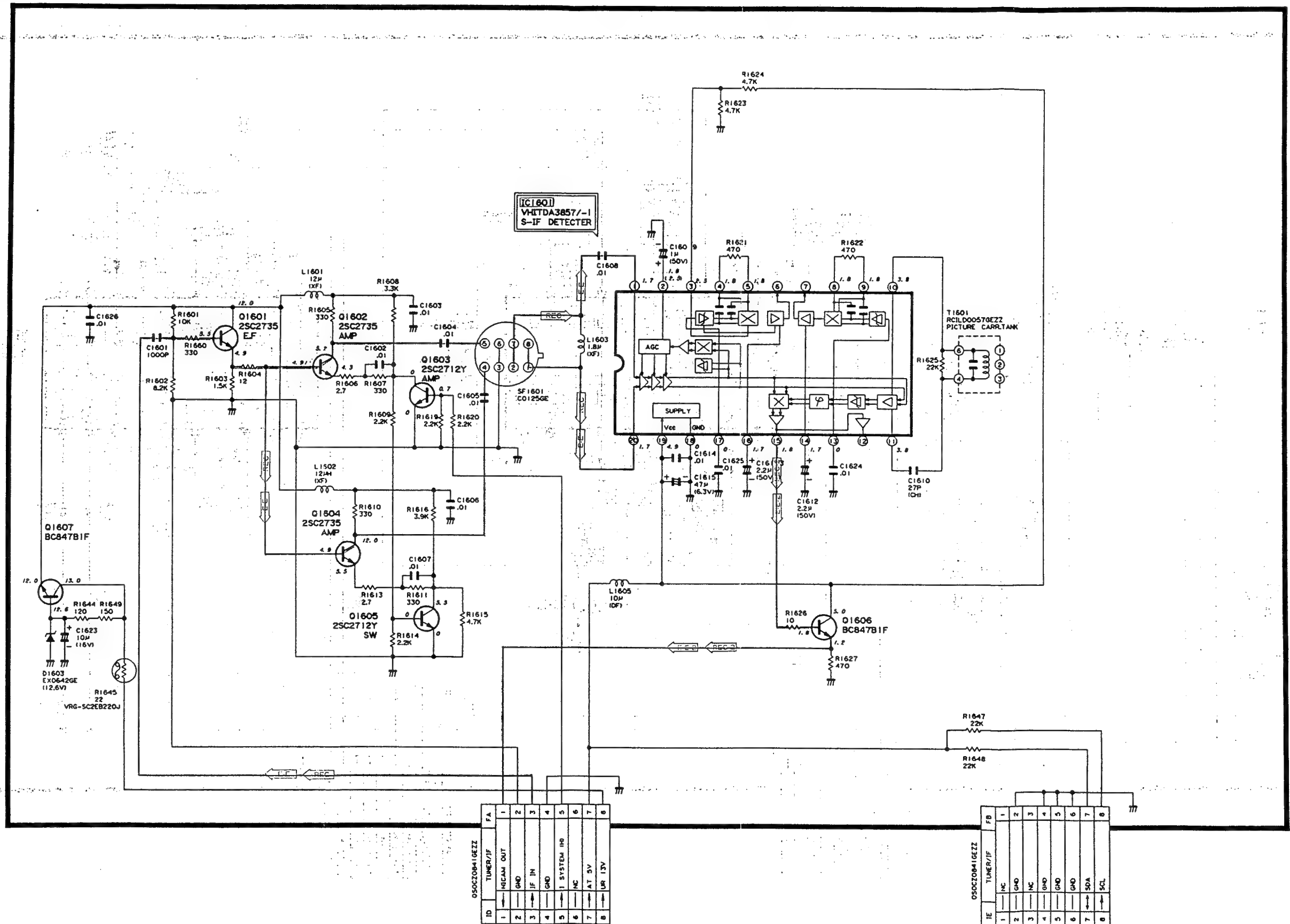
TUNER/IF CIRCUIT (VC-H96/VC-H96ETS/VC-H980/VC-H980ETS)  
调谐器/中频电路图 (VC-H96/VC-H96ETS/VC-H980/VC-H980ETS)



\* VOLTAGE MEASUREMENT MODE  
PB ..... Parentheses ( )  
REC ..... Without Parentheses

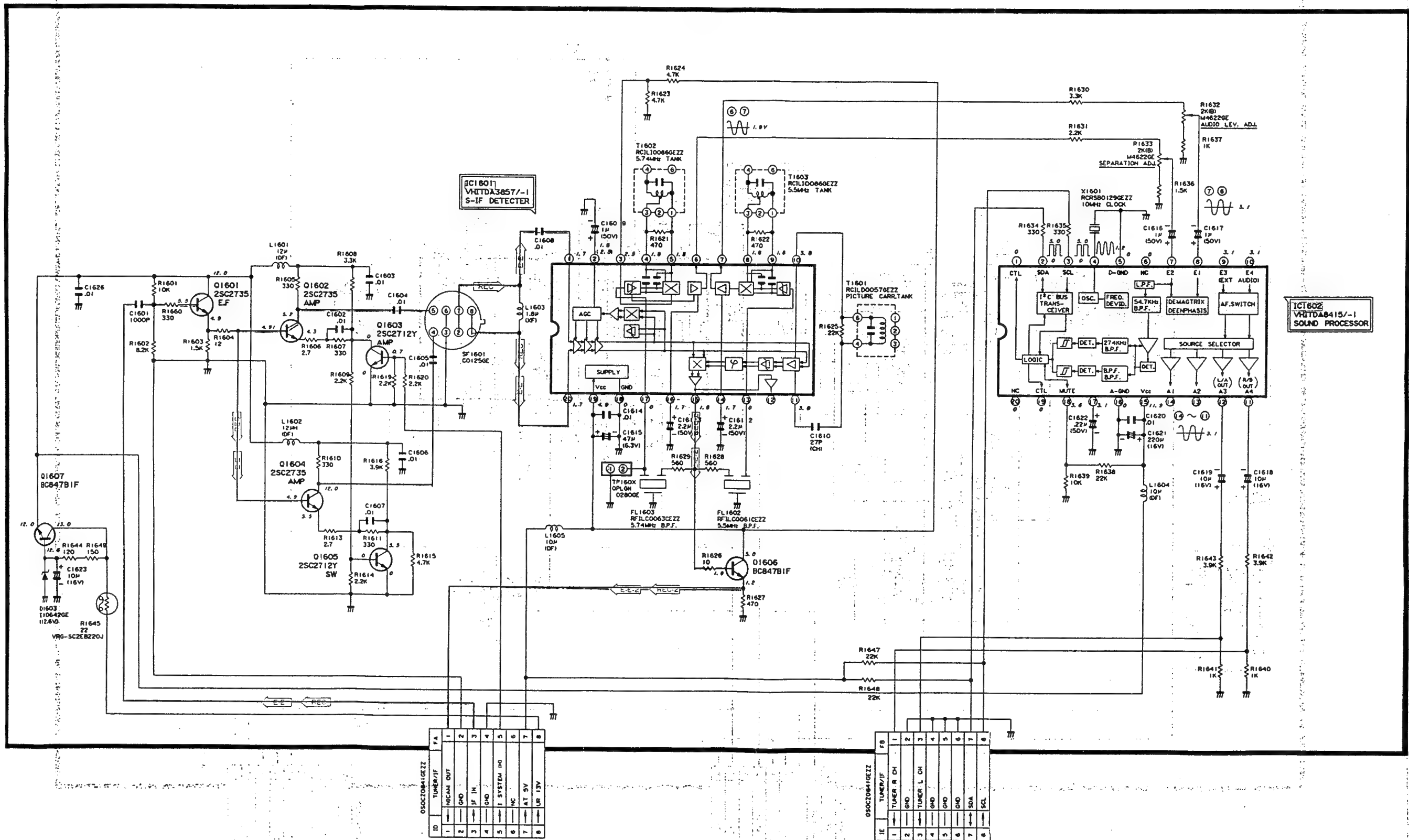
● 电压测量数值  
再现: 括弧内的数值  
记录: 无括弧的数值

SIF/MPX CIRCUIT (VC-H96/VC-H96ETS/VC-H980)  
SIF/MPX 电路 (VC-H96/VC-H96ETS/VC-H980)

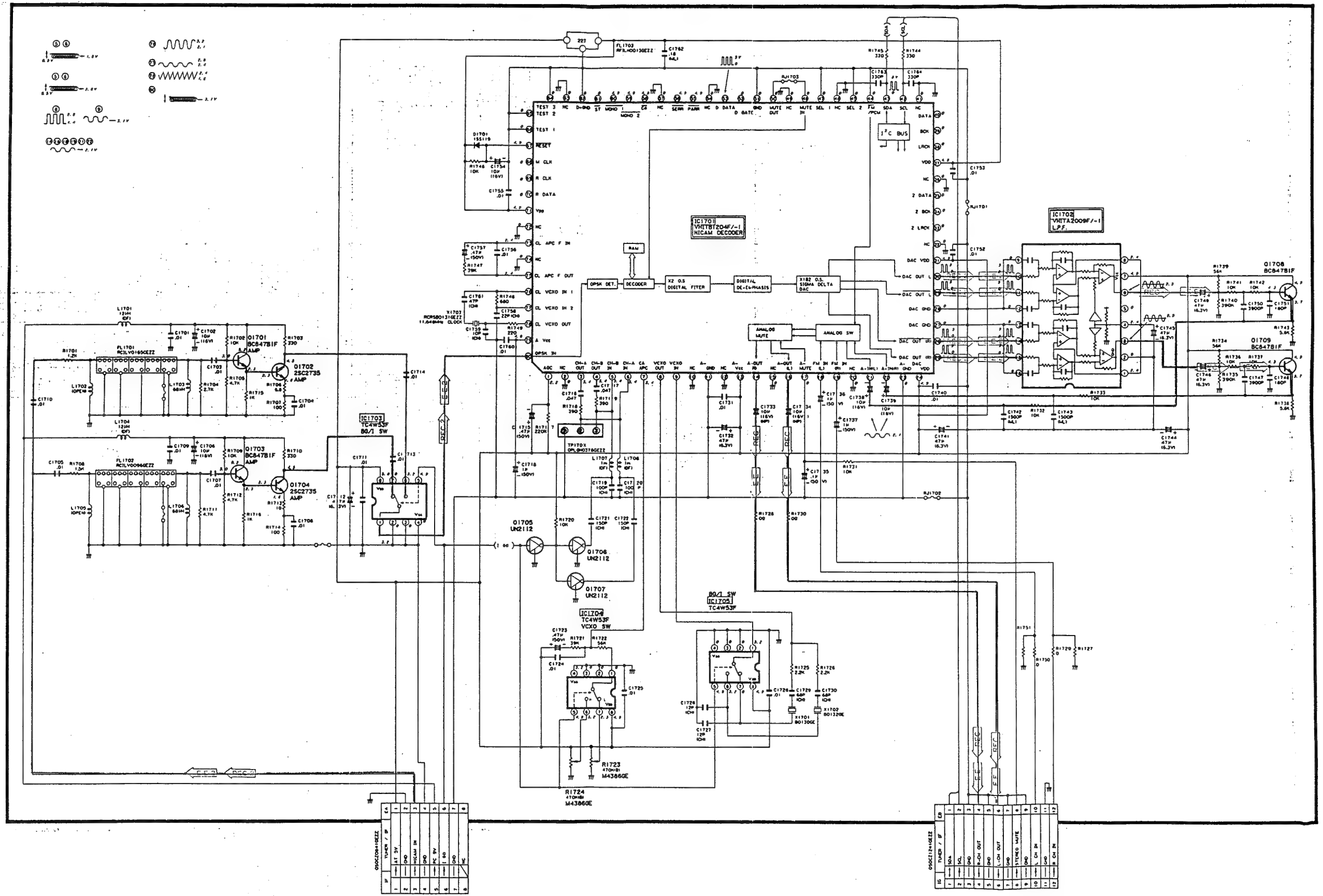




SIF/MPX CIRCUIT (VC-H980ETS)  
SIF/MPX 电路 (VC-H980ETS)



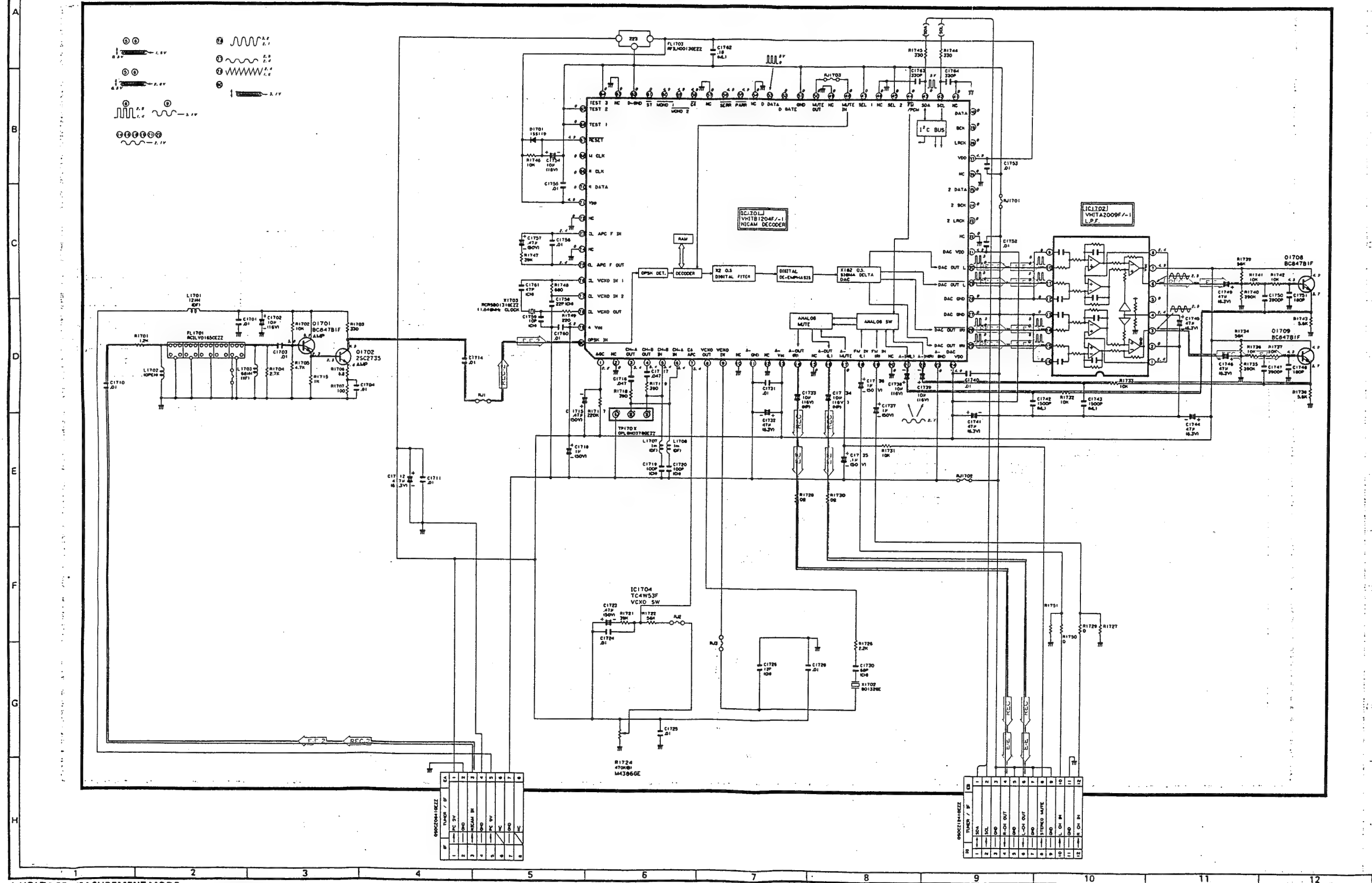
NICAM CIRCUI (VC-H96/VC-H96ETS)  
NICAM电路 (VC-H96/VC-H96ETS)



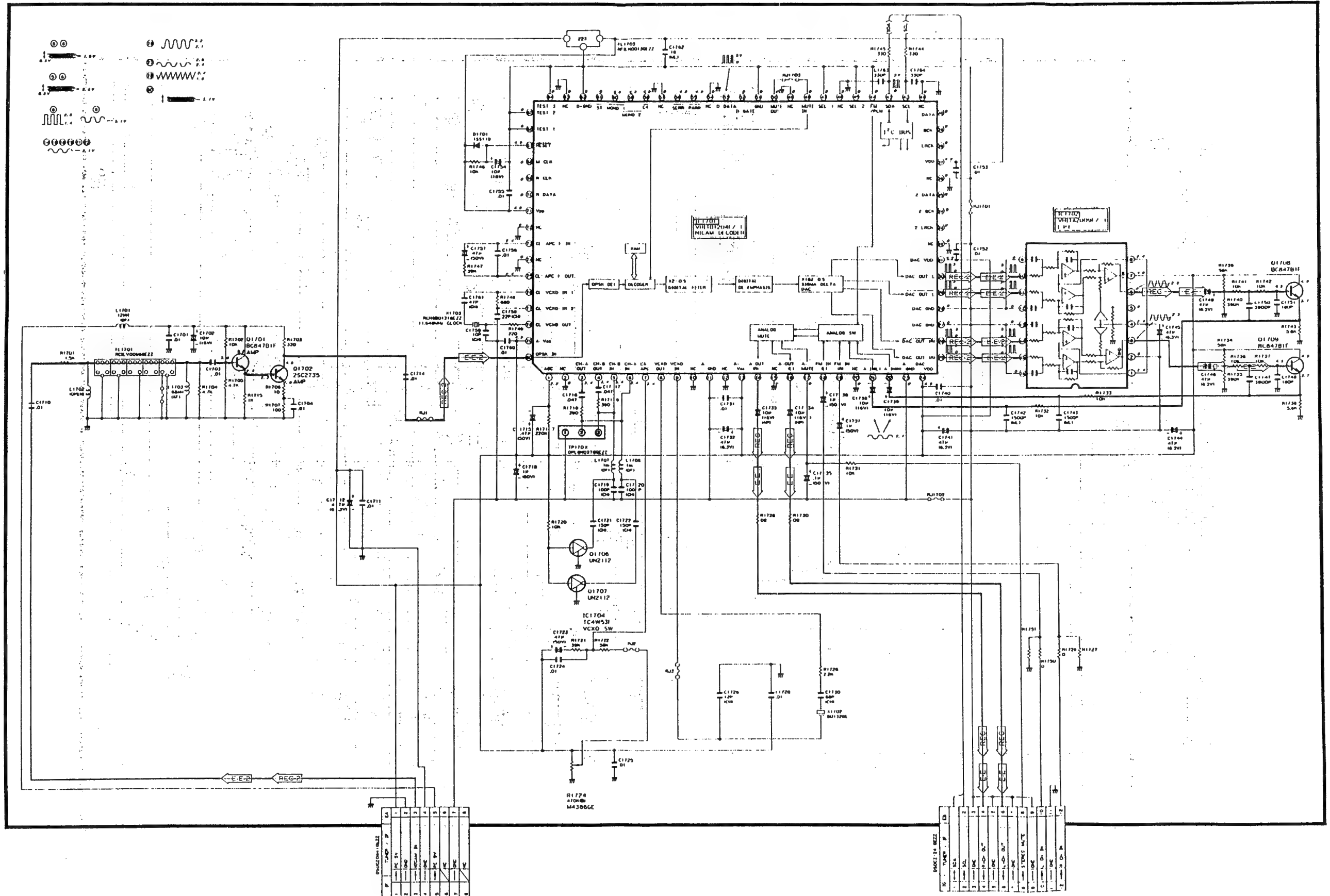
VC-H91/H91ETS  
VC-H96/H96ETS  
VC-H980/H980ETS

VC-H91/H91ETS  
VC-H96/H96ETS  
VC-H980/H980ETS

# NICAM CIRCUIT (VC-H980) NICAM电路 (VC-H980)



NICAM CIRCUIT (VC-H980ETS)  
NICAM电路 (VC-H980ETS)



• VOLTAGE MEASUREMENT MODE

PB ..... Parentheses ( )

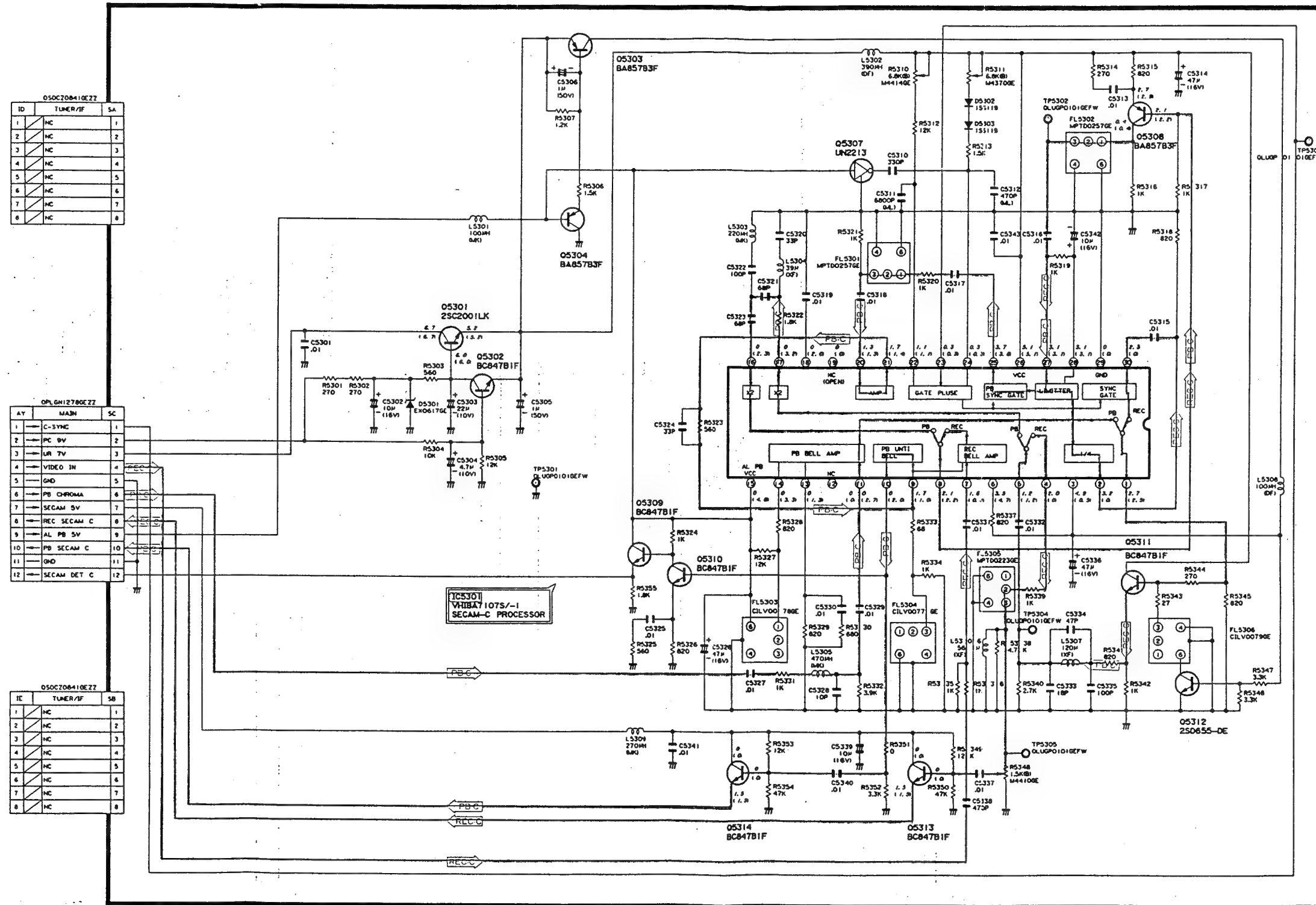
REC ..... Parentheses ( )

• 电压测量数值

出现：括弧内的数值

出现：未括弧的数值

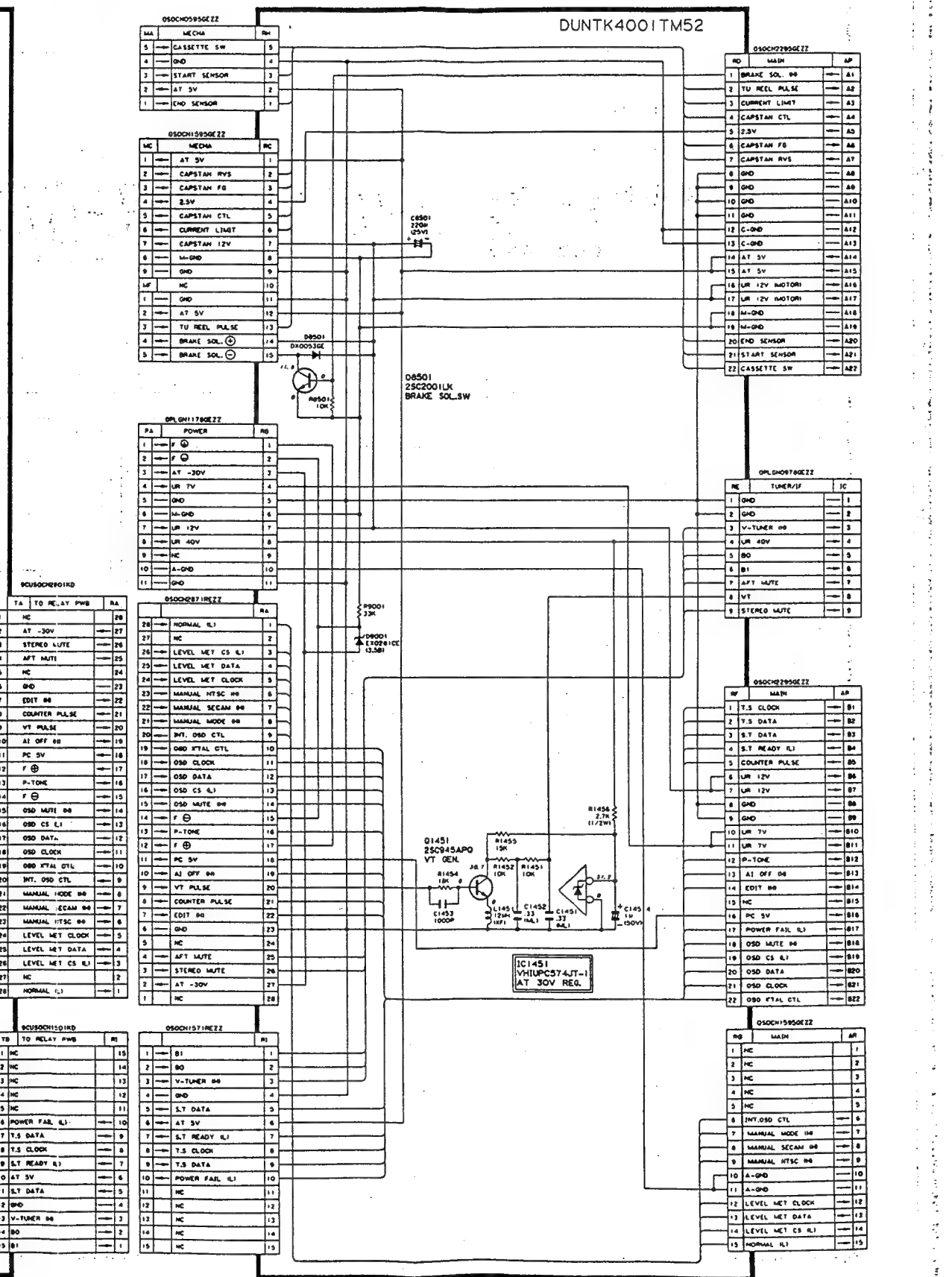
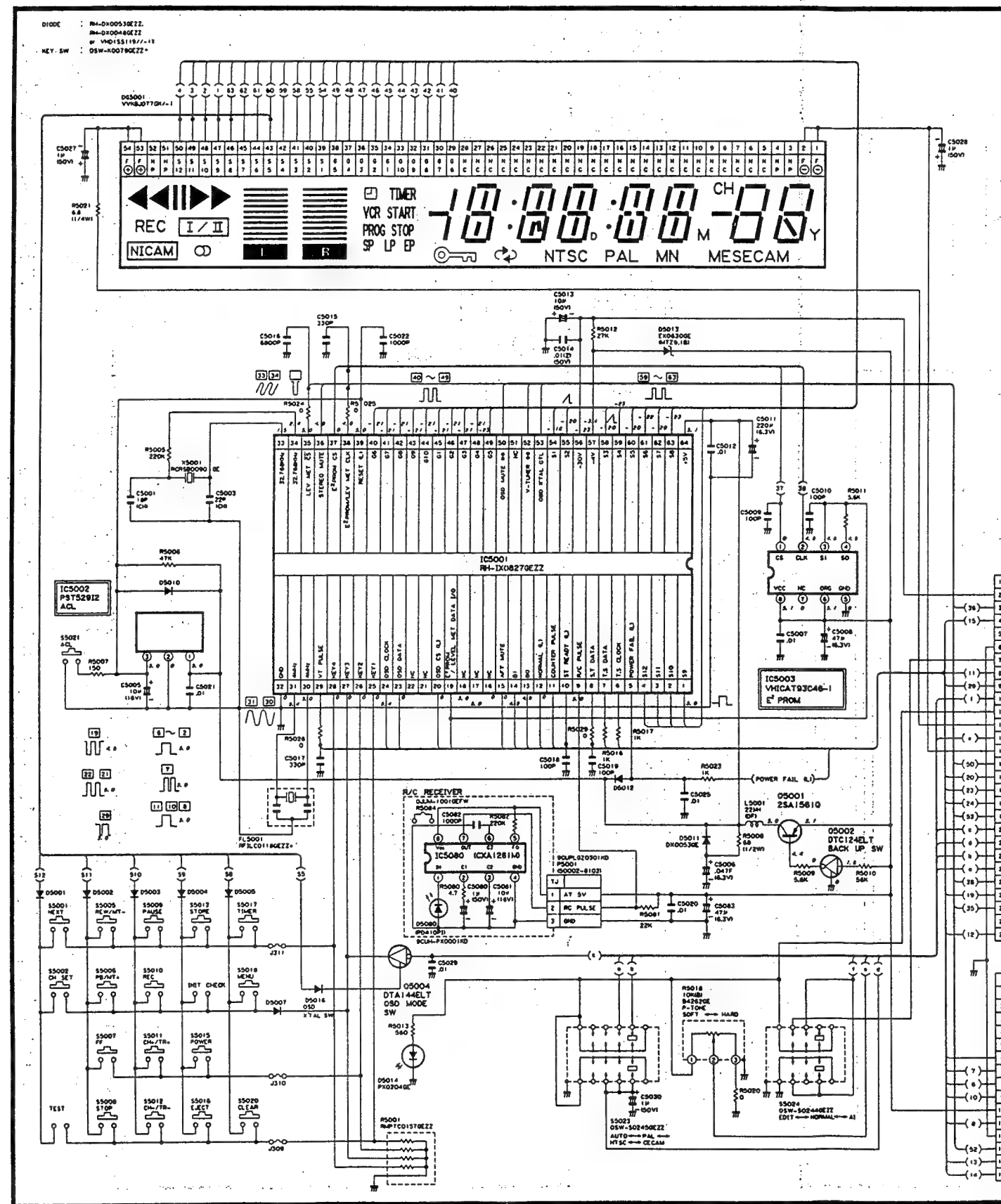
SECAM CHROMA CIRCUIT (VC-H91/VC-H91ETS)  
SECAM色度电路 (VC-H91/VC-H91ETS)



VC-H91/H91ETS  
VC-H96/H96ETS  
VC-H980/H980ETS

VC-H91/H91ETS  
VC-H96/H96ETS  
VC-H980/H980ETS

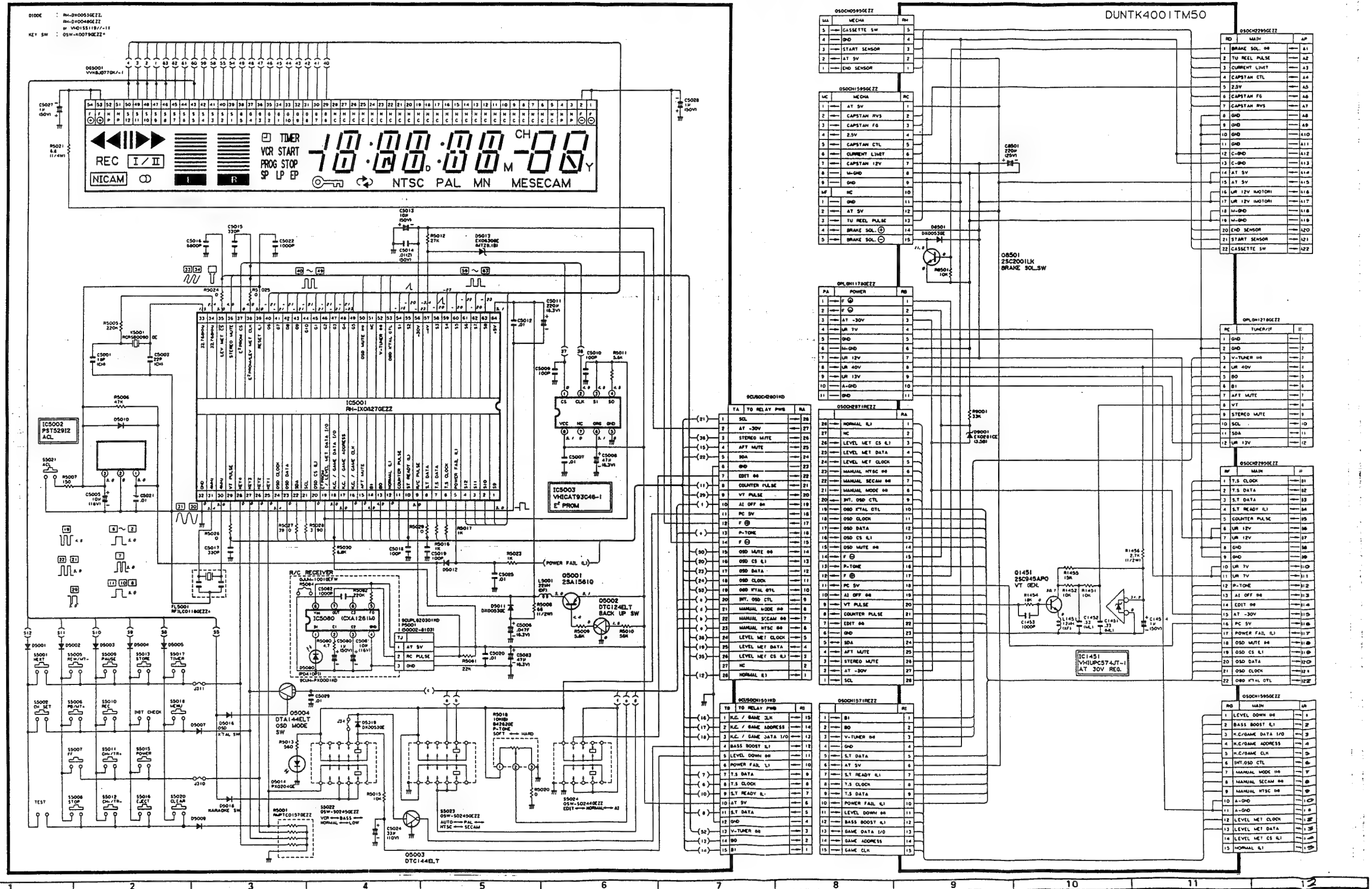
# TIMER · RELAY CIRCUIT (VC-H91/VC-H91ETS) 定时器/继电器电路 (VC-H91/VC-H91ETS)





**VC-H91/H91ETS**  
**VC-H96/H96ETS**  
**VC-H980/H980ETS**

**TIMER · RELAY CIRCUIT (VC-H980/VC-H980ETS)**  
**定时器/继电器电路 (VC-H980/VC-H980ETS)**

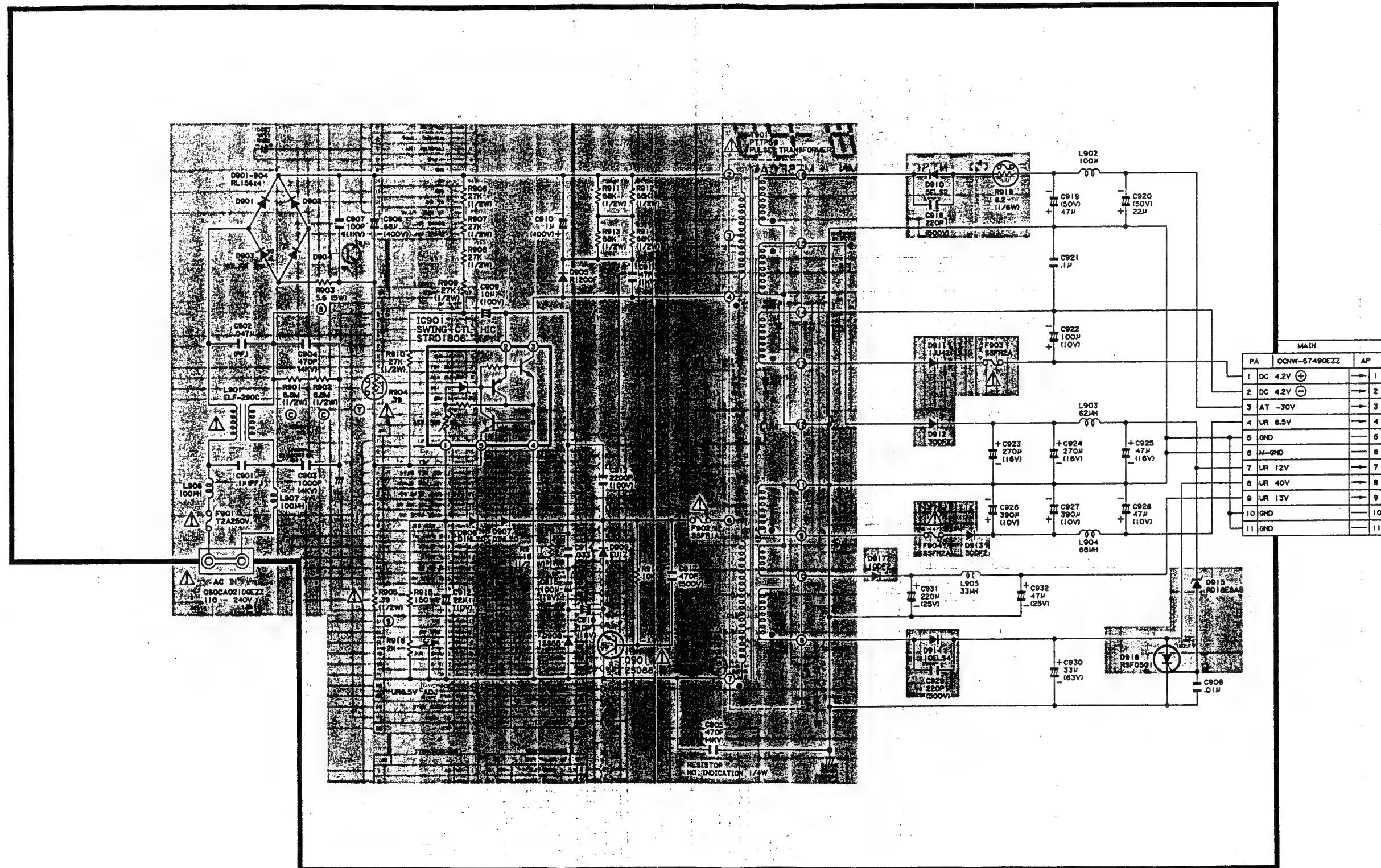




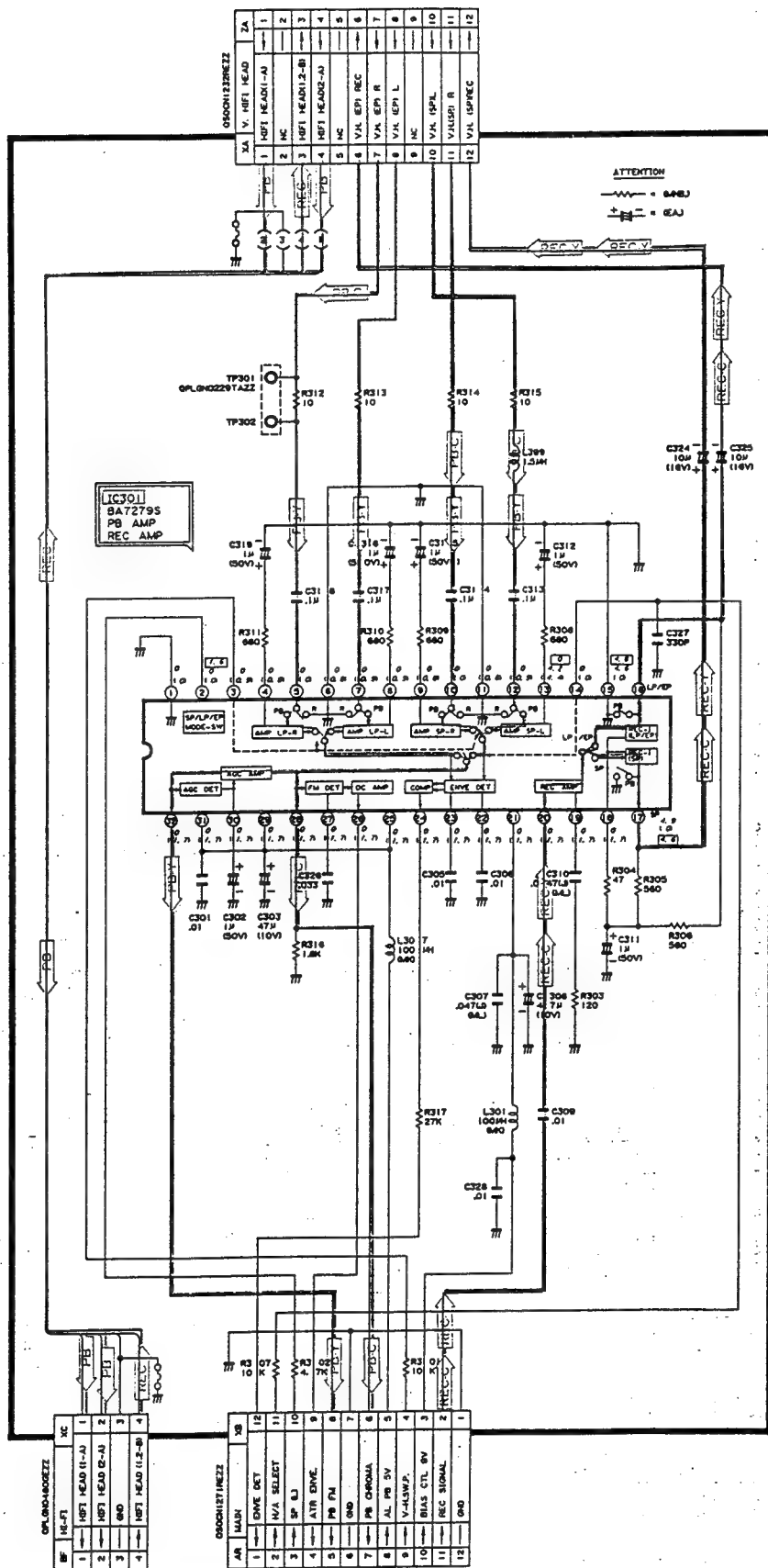
VC-H91/H91ETS  
VC-H96/H96ETS  
VC-H980/H980ETS

VC-H91/H91ETS  
VC-H96/H96ETS  
VC-H980/H980ETS

# POWER CIRCUIT 电源电路



# HEAD AMP CIRCUIT 前置放大器电路



• VOLTAGE MEASUREMENT MODE

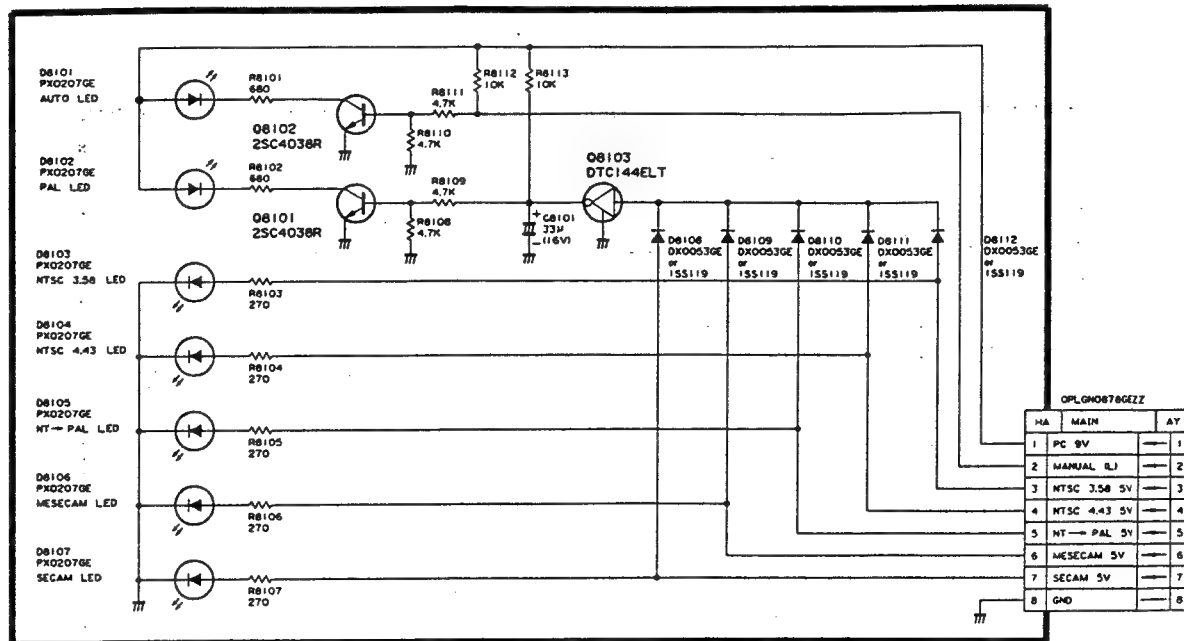
PB ..... Parentheses ( )  
REC ..... Without Parentheses

• 电压测量数值  
再现: 括弧内的数值  
记录: 无括弧的数值

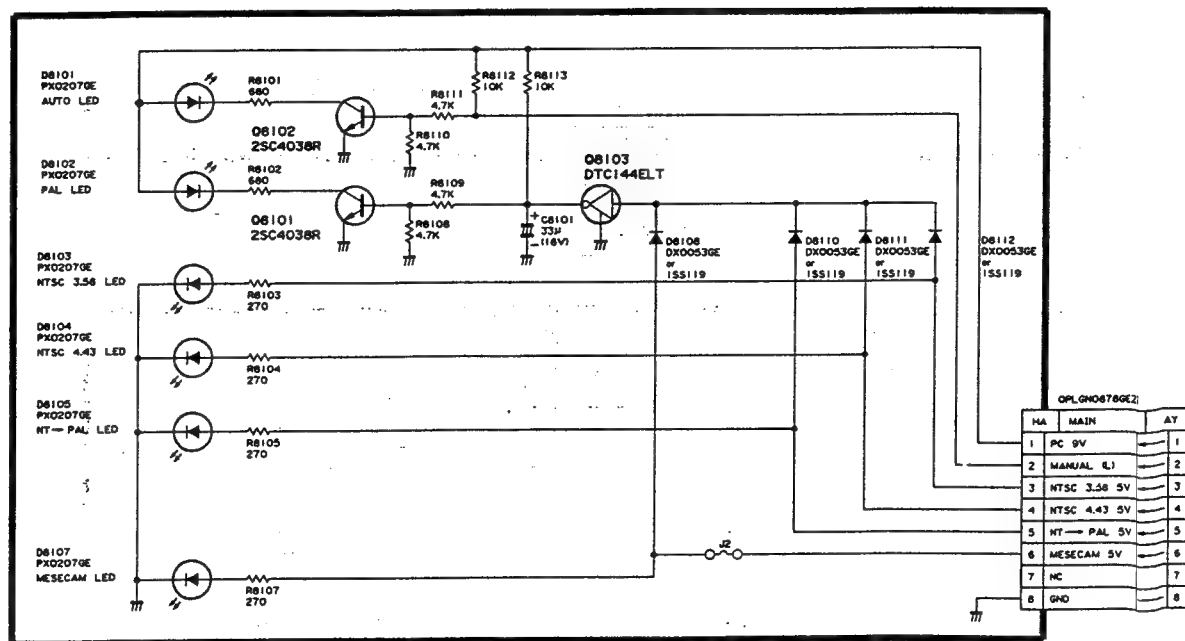
## IF PACK CIRCUIT 中频包电路



# SYSTEM LED CIRCUIT (VC-H91/VC-H91ETS) 系统液晶显示器电路 (VC-H91/VC-H91ETS)

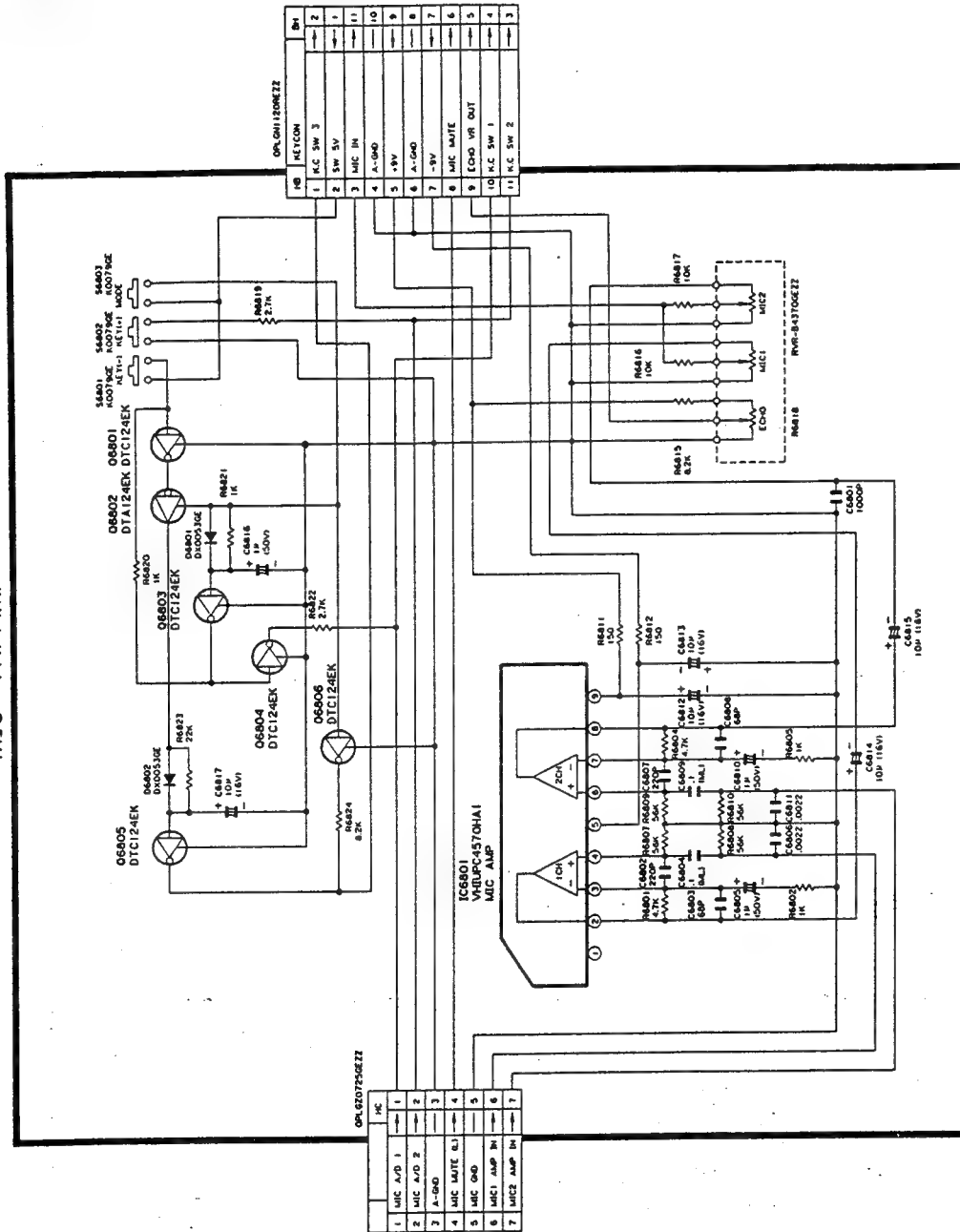


# SYSTEM LED CIRCUIT (VC-H96/VC-H96ETS) 系统液晶显示器电路 (VC-H96/VC-H96ETS)

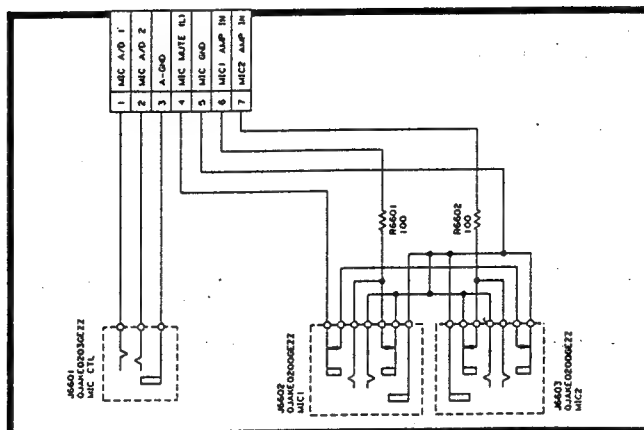


# MIC AMP · MIC JACK CIRCUIT (VC-H980/VC-H980ETS) 麦克风放大器电路 · 麦克风插座电路 (VC-H980/VC-H980ETS)

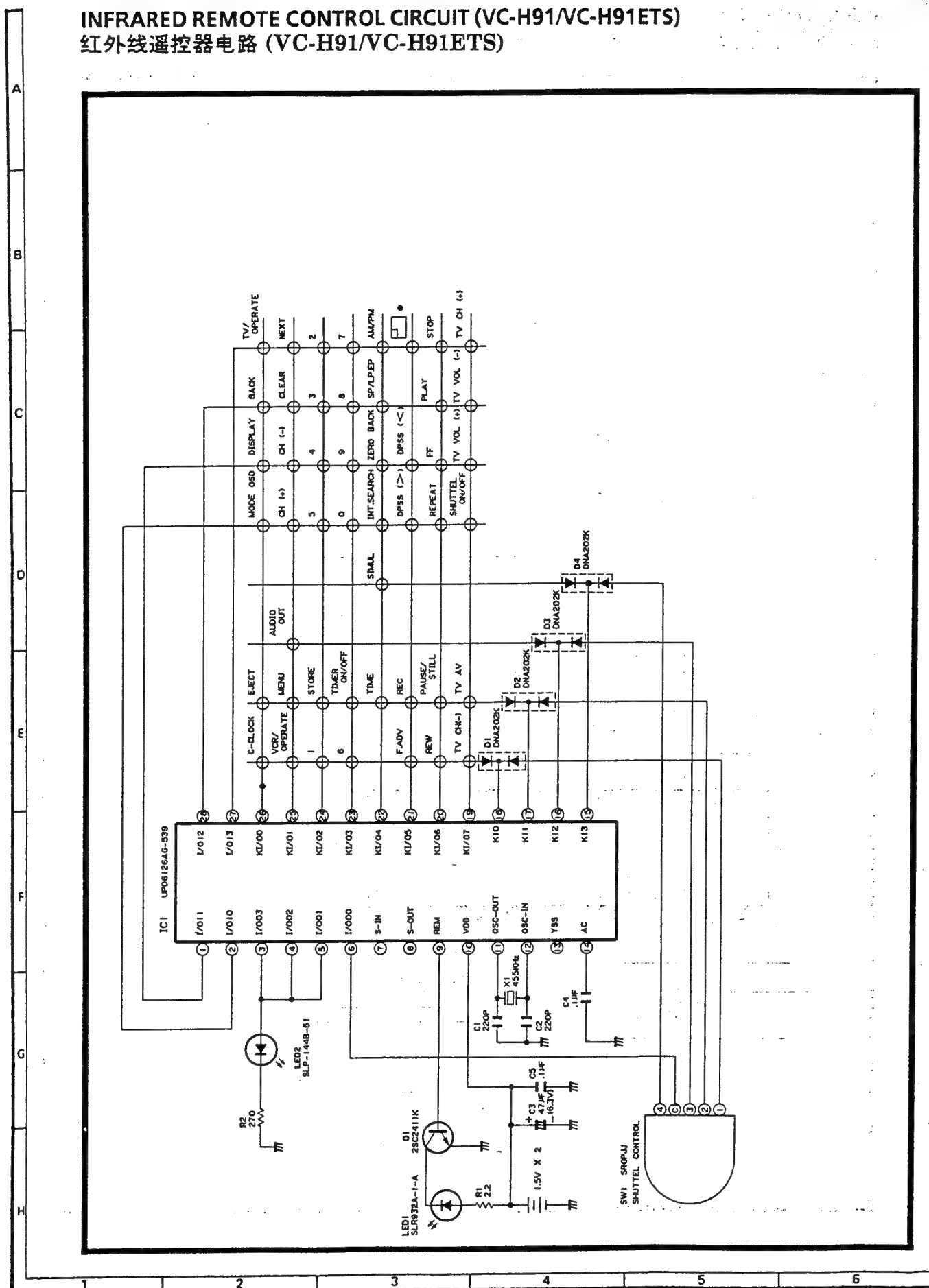
## MIC VR/AMP



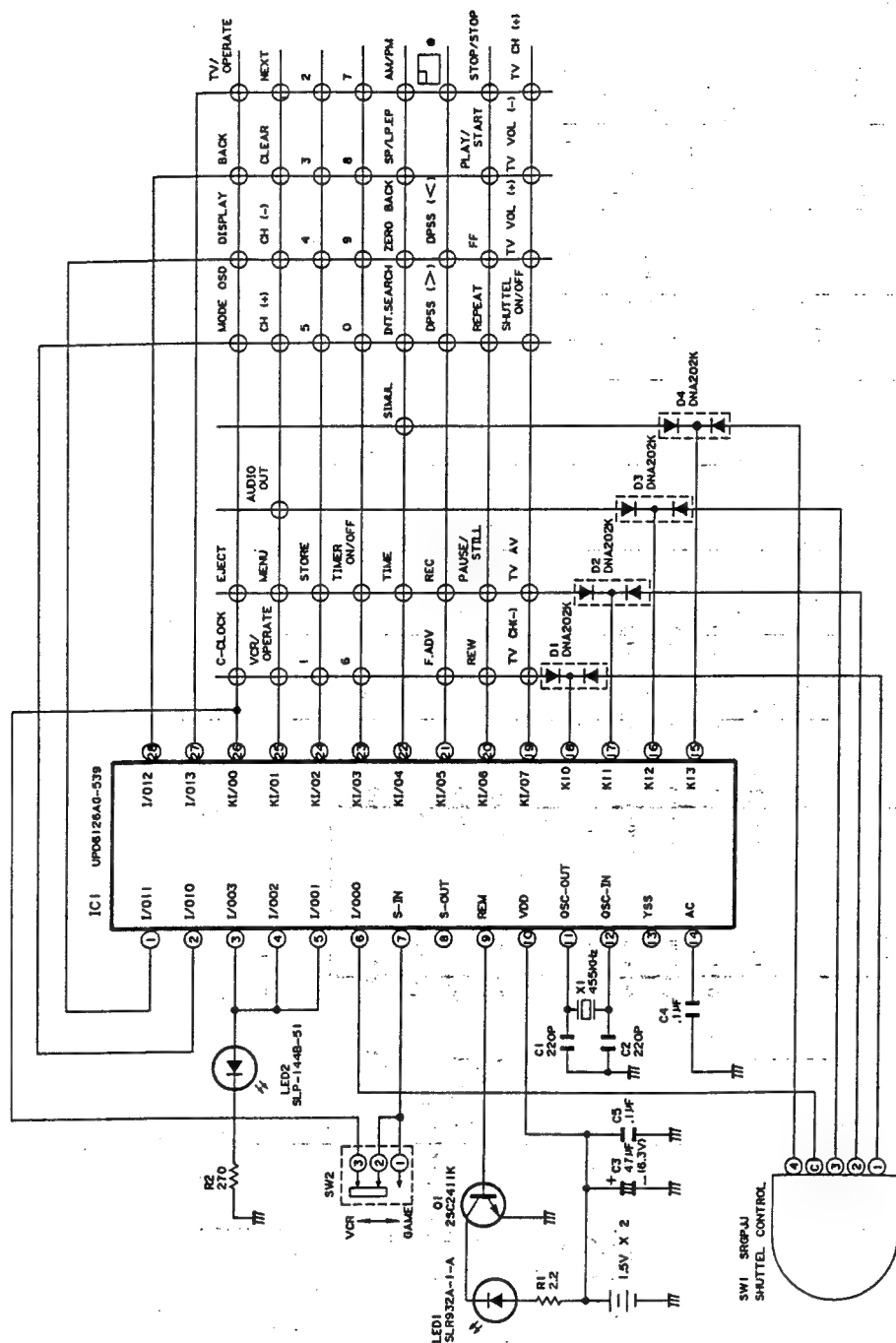
## MIC JACK



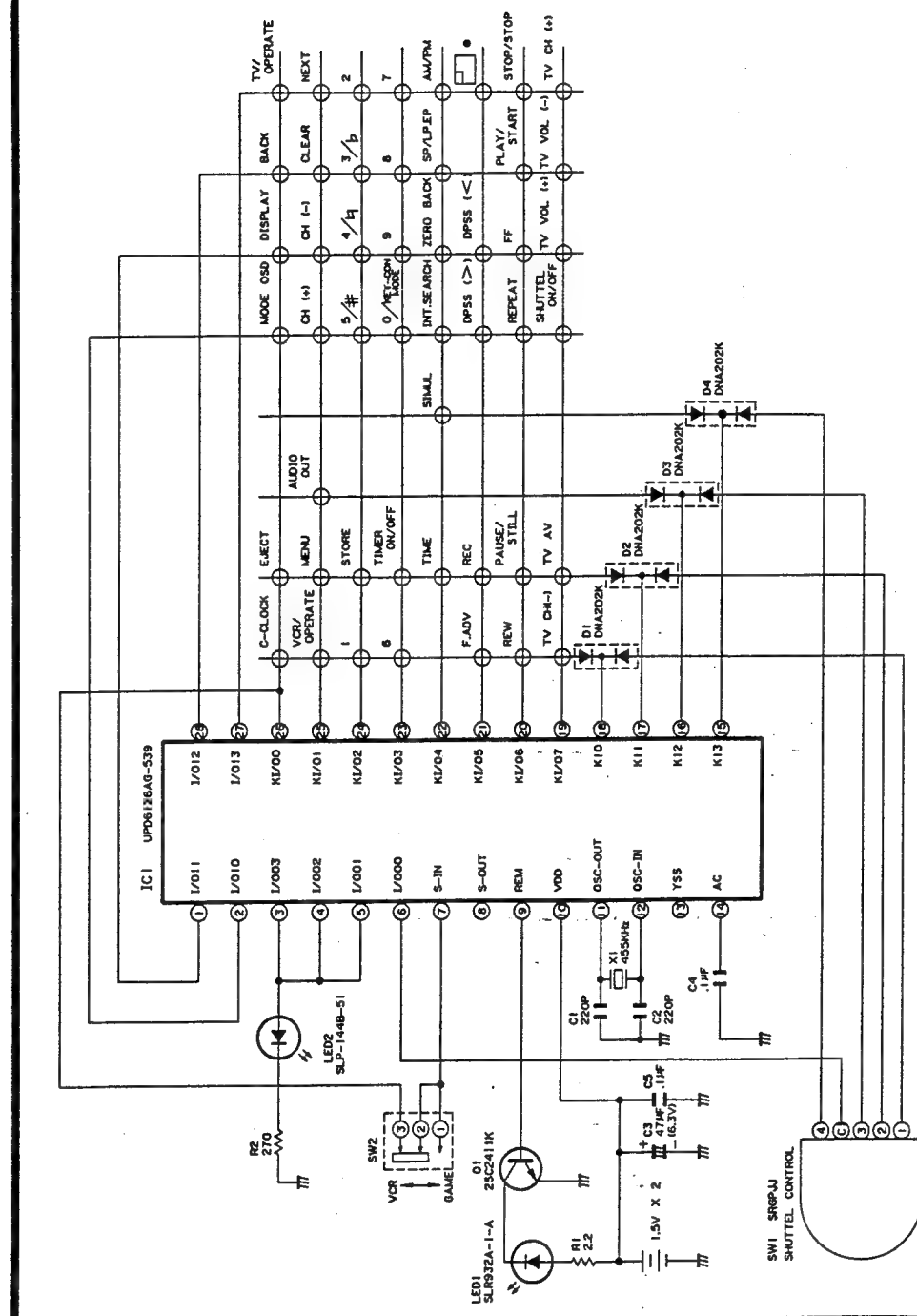
### INFRARED REMOTE CONTROL CIRCUIT (VC-H91/VC-H91ETS) 红外线遥控器电路 (VC-H91/VC-H91ETS)



**INFRARED REMOTE CONTROL CIRCUIT (VC-H96/VC-H96ETS)**  
**红外线遥控器电路 (VC-H96/VC-H96ETS)**



**INFRARED REMOTE CONTROL CIRCUIT (VC-H980)**  
**红外线遥控器电路 (VC-H980)**



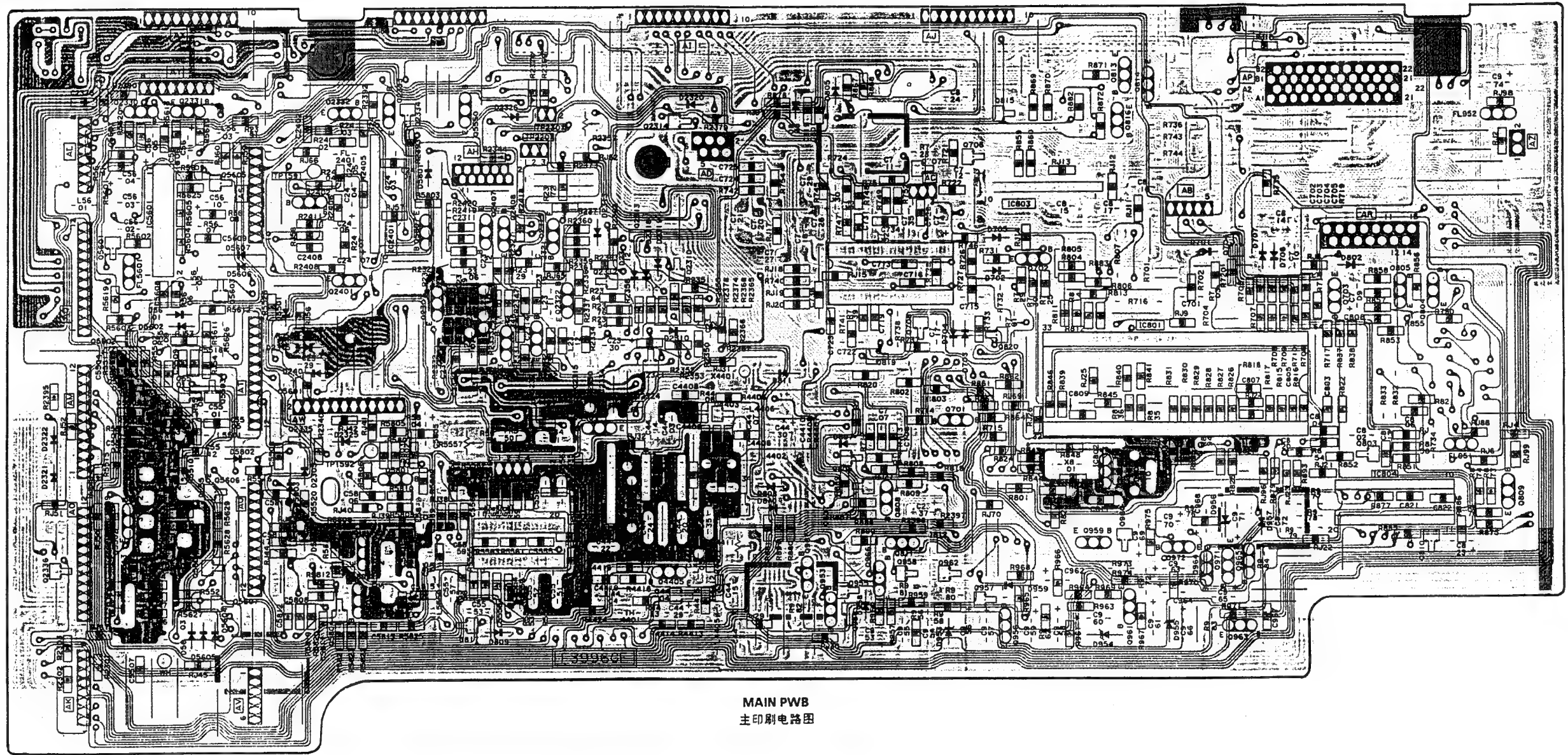


### INFRARED REMOTE CONTROL CIRCUIT (VC-H980ETS)

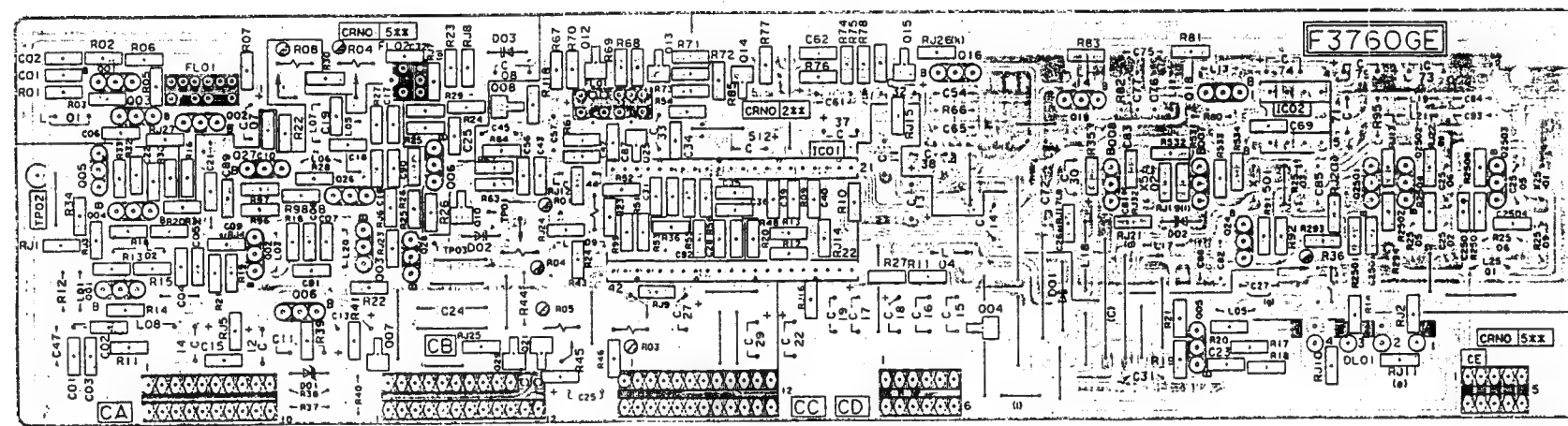


VC-H91/H91ETS  
VC-H96/H96ETS  
VC-H980/H980ETS

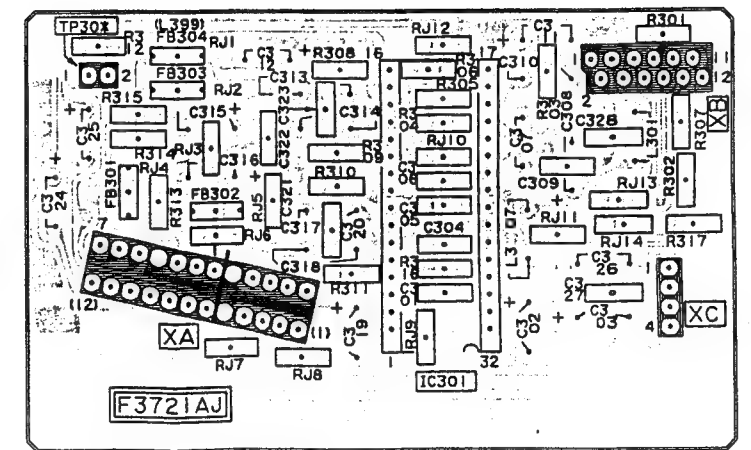
## WIRING SIDE PWB



**MAIN PWB**  
**主印刷电路图**



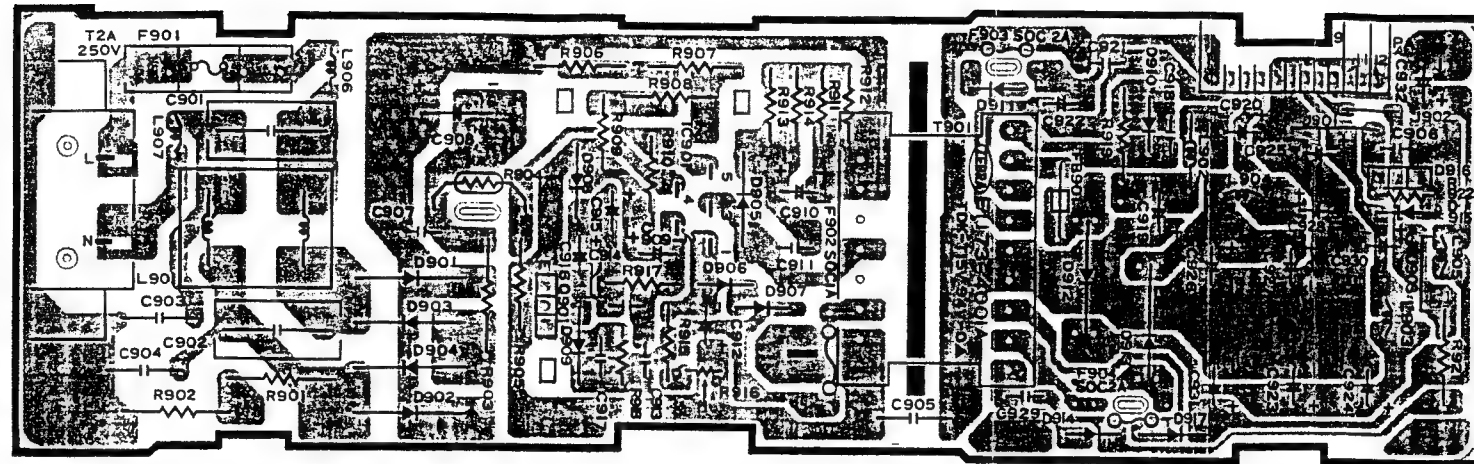
Y/C PWB  
Y/C(亮度/色度)印刷电路图



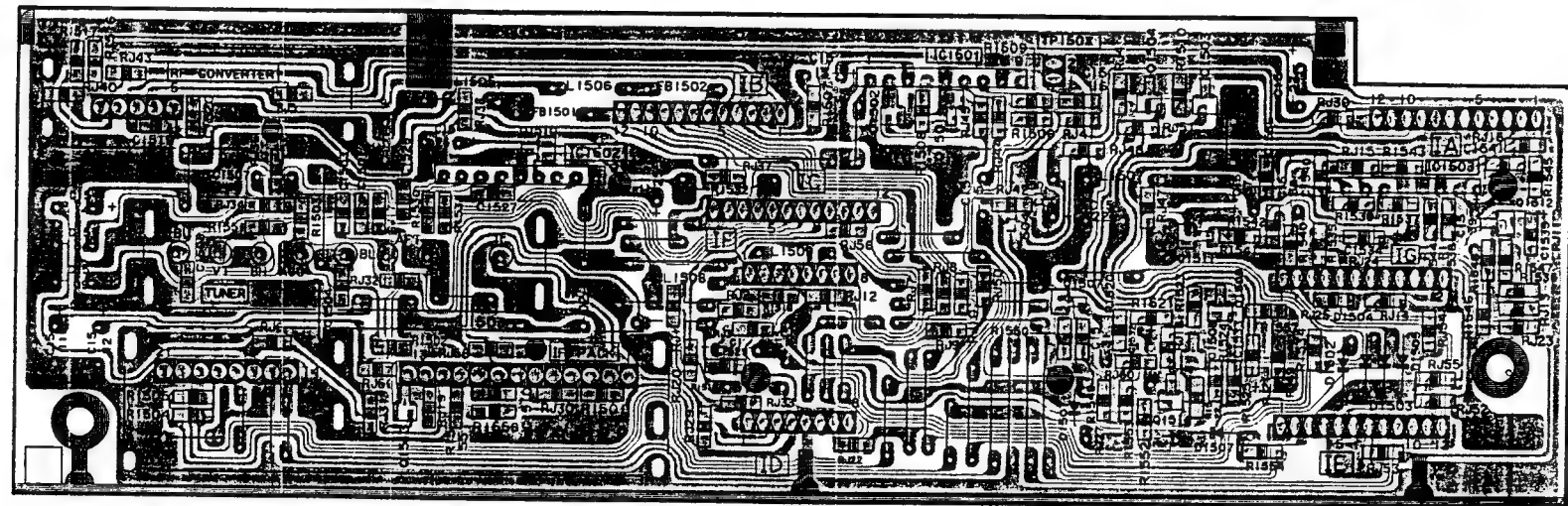
### HEAD AMP PWB 前置放大器印刷电路图

VC-H91/H91ETS  
VC-H96/H96ETS  
VC-H980/H980ETS

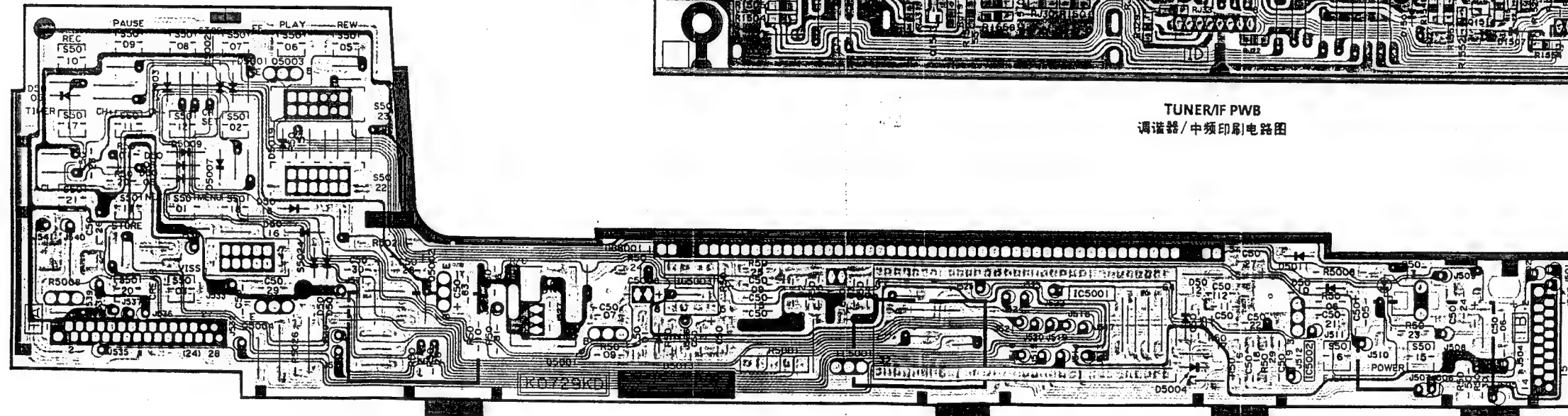
VC-H91/H91ETS  
VC-H96/H96ETS  
VC-H980/H980ETS



POWER PWB  
电源印刷电路图



TUNER/IF PWB  
调谐器/中频印刷电路图



TIMER PWB  
定时器印刷电路图



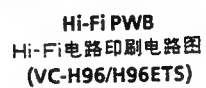
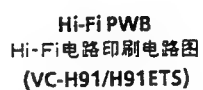
**RELAY PWB**  
继电器印刷电路板

**TERMINAL PWB**  
终端电路印刷电路板

**RELAY PWB**  
继电器印刷电路图

**TERMINAL PWB**  
终端电路印刷电路板

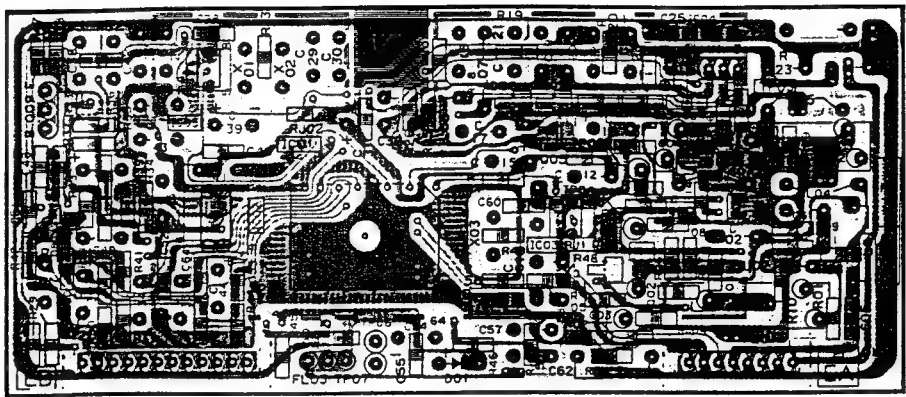
1



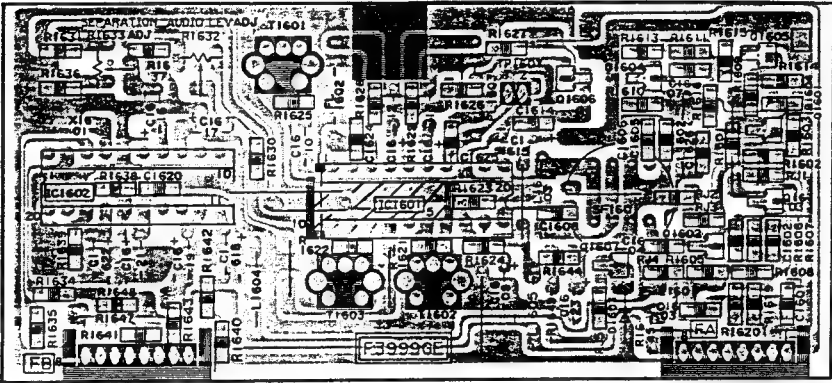


Hi-Fi PWB  
Hi-Fi电路印刷电路图  
(VC-H980/H980ETS)

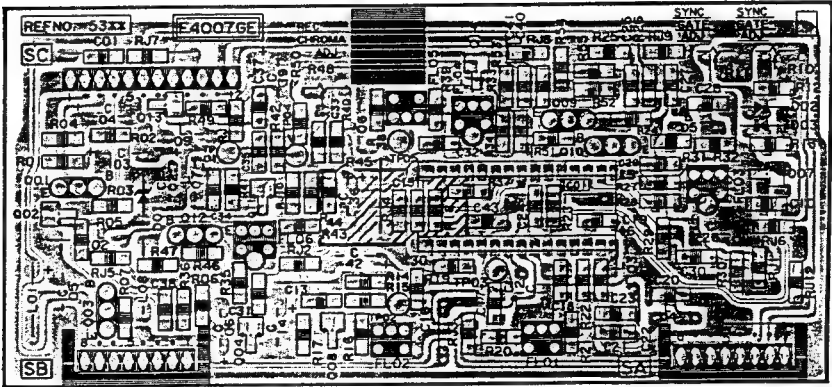
-H91/H91ETS  
-H96/H96ETS  
-H980/H980ETS



NICAM PWB  
NICAM电路印刷电路图  
(VC-H96/H96ETS/H980/H980ETS)



SIF/MPX PWB  
SIF/MPX 印刷电路图  
(VC-H96/H96ETS/H980/H980ETS)



SECAM CHROMA PWB  
SECAM色度电路印刷电路图  
(VC-H91/H91ETS)





## REPLACEMENT PARTS LIST

### PARTS REPLACEMENT

Many electrical and mechanical parts in video cassette recorder have special safety-related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this manual; electrical components having such features are identified by  $\Delta$  and shaded areas in the Replacement Parts Lists and Schematic Diagrams. The use of a substitute replacement part which does not have the same safety characteristics as the factory recommended replacement parts shown in this service manual may create shock, fire or other hazards.

#### "HOW TO ORDER REPLACEMENT PARTS"

To have your order filled promptly and correctly, please furnish the following informations.

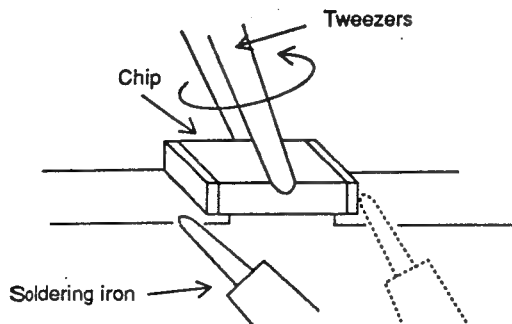
- |                 |                |
|-----------------|----------------|
| 1. MODEL NUMBER | 2. REF. NO.    |
| 3. PART NO.     | 4. DESCRIPTION |
| 5. PRICE CODE   |                |

#### Precautions for replacing the chip

1. Before replacing the chip, make sure that the power is off.
2. When using tweezers, take care not to damage the chip surface with them.
3. Do not reuse removed chips.
4. Do not rub the chip electrodes.
5. Do not apply excessive pressure to the chip.
6. Use a pencil-type soldering iron if possible.
7. Keep each soldered spot less than 0.5mm in diameter.
8. Do not heat solder for more than 3 seconds.
9. Keep the soldering temperature at 260°C or less.

#### Removing the chip (diodes, transistors)

1. Remove the solder completely from both ends of the chip using a braided wire or like.
2. As shown in the figure below, while holding the soldering iron against both ends of the chip alternately, twist the tweezers (in the direction of the arrow) to remove the chip.

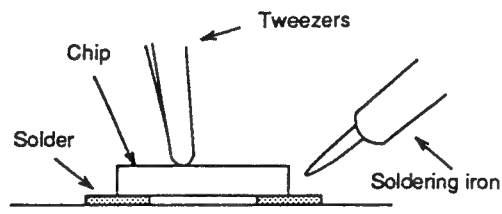


#### Note:

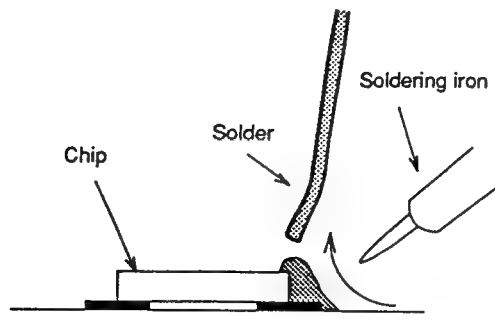
Be careful not to damage other chips.

#### Mounting the chip

1. Place solders in advance at the spots where the chip is to be mounted.
2. Hold the chip down temporarily with tweezers.



3. Solder both ends of the chip.  
(For the chip transistor, solder its three leads.)



#### HOW TO IDENTIFY CHIP TRANSISTORS AND DIODES BY ITS MARKING

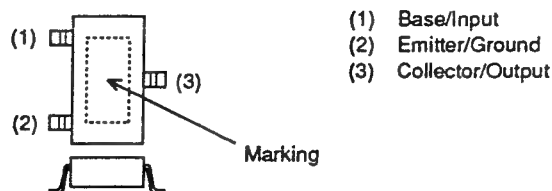


Fig.-1

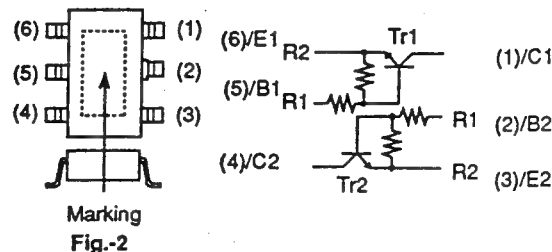


Fig.-2

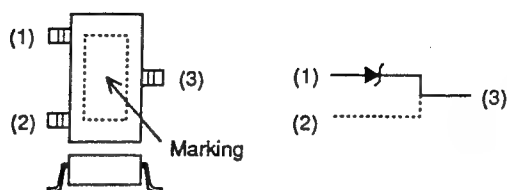
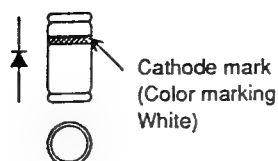


Fig.-3

Fig. 7



Package	Marking	Parts No.
Fig. 1/	FQ	VS2SA1037KQ-1
Fig. 1/	SY	VS2SA1162Y/-1
Fig. 1/	BQ	VS2SC2412KQ-1
Fig. 1/	LY	VS2SC2712Y/-1
Fig. 1/	ND	VS2SD1306-D1E
Fig. 1/	1DS	VS2SD1328-S-1
Fig. 1/	AAS	VS2SD1757KS-1
Fig. 1/	15	VSDTA124EK/-1
Fig. 1/	16	VSDTA144EK/-1
Fig. 1/	22	VSDTC123EK/-1
Fig. 1/	25	VSDTC124EK/-1
Fig. 1/	26	VSDTC144EK/-1
Fig. 1/	6B	98M-UN2112///
Fig. 1/	6C	98M-UN2113///
Fig. 1/	8B	98M-UN2212///
Fig. 3/	8R	98M-XN4212///
Fig. 2/	101	98M-RD10MB1//
Fig. 2/	563	98M-RD5R6MB3/
Fig. 7/	---	98M-MA2211///

**⚠ MARK: SAFETY RELATED PARTS**

**PWB ASSEMBLY IS NOT REPLACEMENT ITEM**

Ref. No.	Part No.	Description	Code
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### MAIN CIRCUIT

DUNTK3996XM52	Main Board Assembly (VC-H91, VC-H91ETS)	—
DUNTK3996XM50	Main Board Assembly (VC-H96, VC-H96ETS)	—
DUNTK3996XM53	Main Board Assembly (VC-H980, VC-H980ETS)	—

### TRANSISTORS

Q701, 804, 805, 816, 972, 2320,	VS2SC945APQ1E	2SC945APQ	AB
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Ref. No.	Part No.	Description	Code
2321, 2322, 2407, 5502, 5802, 5805			
Q702, 703, 2307, 2315, 2402, 4401, 4405, 5801	VS2SA733APQ1E	2SA733APQ	AC
Q704, 707, 708, 810, 820, 2312, 2313, 5501, 5503, 5606, 5607	VSBC857B3F/-1	BC857B3F  (VC-H91, VC-H91ETS)	AA
Q706, 803, 954, 957, 2310, 4403, 4404, 5504, 5506, 5601, 5803, 5804	VSBC847B1F/-1	BC847B1F	AA
Q806, 818, 819, 960, 962, 5605	VSUN2212///-1	UN2212	AA
Q807, 812,  815, 955, 958, 2314	VSUN2112///-1	UN2112  (VC-H96, VC-H96ETS, VC-H980, VC-H980ETS)	AA
Q808, 811	VSKRA103M// -1	KRA103M (VC-H96, VC-H96ETS, VC-H980, VC-H980ETS)	AA
Q813, 814, 959	VSKRC103M// -1	KRC103M	AA

C-H91/H91ETS  
C-H96/H96ETS  
C-H980/H980ETS

Ref. No.	Part No.	Description	Code	Ref. No.	Part No.	Description	Code
Q953,	VS2SD468-C/-1	2SD468-C	AD	<b>DIODES AND CRYSTALS</b>			
956,				D701	VHD1SS119//-1	1SS119	AB
963,							
965,		(VC-H96, VC-H96ETS, VC-H980, VC-H980ETS)		707,			
966,				801,			
967,				802,			
971				805,			
Q961	VS2SA1271-Y-1	2SA1271-Y	AB	807,			
Q964	VS2SC3198-Y-1	2SC3198-Y	AA	808,			
Q2311,	VSUN2213///-1	UN2213	AA	810,			
2324,				811,			
2334,				957,			
2335,				958,			
2336,		(VC-H980, VC-H980ETS)		959,			
5505,				2305,			
5602,		(VC-H91, VC-H91ETS)		2310			
5603,							
5604		(VC-H91, VC-H91ETS)		2313,			
Q2330,	VSKRC104M//-1	KRC104M	AA	2315,			
		(VC-H91, VC-H91ETS)		2318,			
2331,				2320,			
2332,				2321,		(VC-H96, VC-H96ETS, VC-H980, VC-H980ETS)	
2333,				2322,		(VC-H980, VC-H980ETS)	
2401,				2325,			
5550,				2326,			
5807				2401,			
Q2408	VSKRA104M//-1	KRA104M	AA	5501,			
<b>INTEGRATED CIRCUITS</b>				5502,			
IC702	RH-IX0981GEZZ		AH	5601,			
IC801	RH-IX0726GEZZ		AX	5602,			
IC802	VHIPST529D2-1		AD	5603,		(VC-H91, VC-H91ETS)	
IC803	VHIBA6209//-1		AK	5604,		(VC-H91, VC-H91ETS)	
IC804	VHIM66006P/-1		AK	5605,		(VC-H91, VC-H91ETS)	
IC2401	VHILA7210//-1		AH	5606,			
IC4401	VHITL8811P/-1		AM	5607,			
IC4402	VHITA7347P/-1		AG	5801,			
IC5501	VHIM52063SP-1		AP	5802,		(VC-H91, VC-H91ETS)	
IC5601	VHIBA7025L/-1		AP	5803			
				D953	RH-EX0155GEZZ	10B2	AA
				D954	RH-EX0156GEZZ	10EB3	AA
				D955,	RH-EX0138GEZZ	5.6EB3	AA
						(VC-H91, VC-H91ETS)	
				956			
				D955	RH-EX0139GEZZ	6.2EB1	AA
						(VC-H96, VC-H96ETS, VC-H980, VC-H980ETS)	
				TH4401	RH-HZ0031GEZZ	Thermistor	AB
				X801	RCRSB0136GEZZ	Crystal, 7.16MHz	AF
				X4401	RCRSB0111GEZZ	Crystal, 13.566MHz	AG
				<b>PACKAGED CIRCUIT</b>			
				PR5501	RMPTP0011GEZZ		AE

Ref. No.	Part No.	Description	Code	Ref. No.	Part No.	Description	Code
<b>CONTROLS</b>							
R701	RVR-M4632GEZZ	100k(B) PAL Phase Generator Adj.	AB	C735	VCFYSA1HB333J	0.033 $\mu$ F, 50V, 5%, Mylar	AE
R704	RVR-M4351GEZZ	680k(B) NTSC Phase Generator Adj.	AB	C815	RC-KZ0011GEZZ	0.1 $\mu$ F, Ceramic	AA
R2357	RVR-M4415GEZZ	10k(B) Picture Control Adj.	AB	C816	VCE9EA1HW335M	3.3 $\mu$ F, 50V, 20%, Electrolytic (N.P.)	AB
R4411	RVR-M4328GEZZ	2.2k(B) Level Adj.	AB	C817	VCEAGA1EW107M	100 $\mu$ F, 25V, 20%, Electrolytic	AD
R5557	RVR-M4625GEZZ	6.8k(B)	AB	C972, 2403	VCFYSA1HB224J	0.22 $\mu$ F, 50V, 5%, Mylar	AB
				C974, 2407, 4422, 5611	VCEAEA1CW107M	100 $\mu$ F, 16V, 20%, Electrolytic	AC
<b>COILS AND DELAY LINES</b>				C2329	VCE9EA1CW106M	10 $\mu$ F, 16V, 20%, Electrolytic (N.P.)	AC
DL5501	RCILZ0293GEZZ	Delay Line	AP	C4424	VCFYSA1HB394J	0.39 $\mu$ F, 50V, 5%, Mylar	AC
DL5502	RCILZ0208GEZZ	Delay Line	AN	C5551, 5552	RC-QZA332TAYJ	0.0033 $\mu$ F, Mylar	AB
DL5801	RCILZ0183GEZZ	Delay Line	AK	C5557	VCRYPA1HA561J	560pF, 50V, 5%, Mylar	AB
FL2401	RFILA0020GEZZ	Filter	AC	C5603	VCFYSA1HB563J	0.056 $\mu$ F, 50V, 5%, Mylar	AA
FL5601	RFILC0120GEZZ	Filter	AD				
L2301, 5550	VP-DF221K0000	220 $\mu$ H	AB	<b>RESISTORS</b>			
L2306	VP-XF151K0000	150 $\mu$ H	AB	R723, 724	VRN-RA2BK273F	27k ohm, 1/8W, 1%, Metal Film	AA
L2307, 2311, 4404	VP-XF470K0000	47 $\mu$ H	AB				
L2310, 2312	VP-XF150K0000	15 $\mu$ H	AB	<b>MISCELLANEOUS</b>			
L4402, 5802	VP-DF101K0000	100 $\mu$ H	AB	QPLGN0228TAZZ	Plug, 2 pin (TP2301-2302)	AB	
L4403	VP-XF330K0000	33 $\mu$ H	AB	QPLGN0328TAZZ	Plug, 3 pin (TP2201-2203, TP5501-5503 (Except VC-H980, VC-H980ETS))	AD	
L4405	VP-DF680K0000	68 $\mu$ H	AB	QPLGN0378GEZZ	Plug, 3 pin (AC)	AB	
L4406, 4407	VP-XF6R8K0000	6.8 $\mu$ H	AB	QPLGN0428TAZZ	Plug, 4 pin (TP5501-5504) (VC-H980, VC-H980ETS)	AB	
L5501	VP-MK180K0000	18 $\mu$ H	AB	QPLGN0578GEZZ	Plug, 5 pin (AB)	AB	
L5601	VP-XF101K0000	100 $\mu$ H	AB	QPLGN0579GEZZ	Plug, 5 pin (AK) (Except VC-H980, VC-H980ETS)	AB	
L5602	RCILP0043GEZZ	6.8mH	AC	QPLGN0679GEZZ	Plug, 6 pin (AV)	AB	
L5603	VP-MK221K0000	220 $\mu$ H	AB	QPLGN0878GEZZ	Plug, 8 pin (AY)	AC	
L5801	VP-XF120K0000	12 $\mu$ H	AB	QPLGN0879GEZZ	Plug, 8 pin (AK) (VC-H980, VC-H980ETS)	AB	
<b>CAPACITORS</b>				QPLGN0879GEZZ	Plug, 8 pin (AL, AS) (VC-H96, VC-H96ETS, VC-H980, VC-H980ETS))	AB	
C701, 715, 824, 5501	VCFYSA1HB473J	0.047 $\mu$ F, 50V, 5%, Mylar	AA	QPLGN1079GEZZ	Plug, 10 pin (AS) (VC-H91, VC-H91ETS)	AB	
C710, 714, 802	VCEAEA0JW107M	100 $\mu$ F, 6.3V, 20%, Electrolytic	AB	QPLGN1278GEZZ	Plug, 12 pin (AW) (VC-H91, VC-H91ETS)	AC	
C717	VCE9EA1HW225M	2.2 $\mu$ F, 50V, 20%, Electrolytic (N.P.)	AB	QPLGN1279GEZZ	Plug, 12 pin (AM, AO, AQ, AT, AU)	AC	
C722	VCE9EA1HW105M	1 $\mu$ F, 50V, 20%, Electrolytic (N.P.)	AC	QSOCN0694GEZZ	Socket, 6 pin (AD)	AB	
C727, 4431	VCFYSA1HB104J	0.1 $\mu$ F, 50V, 5%, Mylar	AB	QSOCN1270REZZ	Socket, 12 pin (AH)	AC	
C732	VCE9EA1CW226M	22 $\mu$ F, 16V, 20%, Electrolytic (N.P.)	AC	QSOCN1594GEZZ	Socket, 15 pin (AR)	AD	

Ref. No.	Part No.	Description	Code
	QSOCZ1040GEZZ	Socket, 10 pin (AG, AI, AJ, AX)	AC
	QSOCZ4445GEZZ	Socket, 44 pin (AP)	AK

### Y/C CIRCUIT

DUNTK3760XM58	Y/C Board Assembly (VC-H91, VC-H91ETS)	—
DUNTK3760XM57	Y/C Board Assembly (VC-H96, VC-H96ETS, VC-H980, VC-H980ETS)	—

### TRANSISTORS

Q201	VS2C1740SQR1E	2SC1740SQR	AC
204,			
218,			
224,			
226,		(VC-H91, VC-H91ETS)	
227,		(VC-H91, VC-H91ETS)	
502,			
505			
508,			
2502,			
2503			
Q205,	VSDTC144ES/-1	DTC144ES	AB
228,		(VC-H91, VC-H91ETS)	
503			
Q206	VS2SD471-KL1E	2SD471-KL	AC
Q207,	VS2SC2412KQ-1	2SC2412KQ	AA
212			
215			
Q208	VSDTA144EK-1	DTA144EK	AC
Q219,	VS2SA933QR1E	2SA933SQR	AB
501			
Q221,	VSDTC144EK/-1	DTC144EK	AB
225			

### INTEGRATED CIRCUITS

IC201	RH-IX1013GEZZ	AV
IC202	VHILC8992/-1	AK

### DIODES AND CRYSTALS

D201	RH-EX0616GEZZ	MTZJ5.6C	AA
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Ref. No.	Part No.	Description	Code
D202,	RH-DX0053GEZZ	1SS132	AA
203,			
502			
TH201	RH-HZ0035GEZZ	Thermistor	AB
X501	RCRSB0114GEZZ	Crystal, 4.43MHz	AG
X502	RCRSB0133GEZZ	Crystal, 3.58MHz	AF
X2501	RCRSB0121GEZZ	Crystal, 8.93MHz	AH

### CONTROLS

R201,	RVR-M4415GEZZ	10k(B) PB-Y Level Adj.	AB
203,		10k(B) EE Level Adj.	
205		10k(B) FM Carrier Adj.	
R204	RVR-M4414GEZZ	6.8k(B) Deviation Adj.	AB
R208	RVR-M4409GEZZ	1k(B) REC FM Level Adj.	AB
R504	RVR-M4411GEZZ	2.2k(B) REC Chroma Level Adj.	AB

### COILS AND FILTERS

DL501	RCILZ0292GEZZ	Delay Line	AP
FL201	RCILF0217GEZZ	Filter	AG
FL501	RCILF0191GEZZ	Filter	AG
FL502	RCILF0216GEZZ	Filter	AD
L201	VP-XF150K0000	15μH	AB
L202	VP-XF330K0000	33μH	AB
L203	VP-XF180K0000	18μH	AB
L205,	VP-XF151K0000	150μH	AB
207,			
220		(VC-H91, VC-H91ETS)	
L206,	VP-XF680K0000	68μH	AB
209			
L208	VP-DF470K0000	47μH	AB
L211	VP-XF560K0000	56μH	AB
L213,	VP-MK120K0000	12μH	AB
2501			
L214	VP-MK221K0000	220μH	AB
L217	VP-XF5R6K0000	5.6μH	AB
L218	VP-DF221K0000	220μH	AB
L219	VP-XF270K0000	27μH	AB
L221	VP-XF100K0000	10μH	AB
L299	VP-MK4R7K0000	4.7μH	AB
L501	VP-MK561K0000	560μH	AB
L504	VP-MK220K0000	22μH	AB

### CAPACITORS

C227	VCEAGA1AW107M	100μF, 10V, 20%, Electrolytic	AB
C511,	RC-QZA223TAYJ	0.022μF, Mylar	AB
516			
C514,	VCFYSA1HB473J	0.047μF, 50V, 5%, Mylar	AA
519			

**VC-H91/H91ETS**  
**VC-H96/H96ETS**  
**VC-H980/H980ETS**

Ref. No.	Part No.	Description	Code
<b>MISCELLANEOUS</b>			
	QSO CN0679GEZZ	Socket, 6 pin (CD)	AC
	QSO CN0852REZZ	Socket, 8 pin (CA) (VC-H96, VC-H96ETS, VC-H980, VC-H980ETS)	AB
	QSO CN1052REZZ	Socket, 10 pin (CA) (VC-H91, VC-H91ETS)	AC
	QSO CN1252REZZ	Socket, 12 pin (CB, CC)	AC
<b>Hi-Fi CIRCUIT</b>			
	RUNTK0747GEZZ	Hi-Fi Board Assembly (VC-H91, VC-H91ETS)	—
	RUNTK0733GEZZ	Hi-Fi Board Assembly (VC-H96, VC-H96ETS)	—
<b>TRANSISTORS</b>			
Q6301	VS2SC3939R/-1	2SC3939R	AD
Q6302	98M-DTC363TK/	DTC363TK	AC
Q6303,	98M-DTC144EK/	DTC144EK	AB
6307,			
6308,			
6309,			
6329,		(VC-H96, VC-H96ETS)	
6333			
Q6304	98M-DTC143TK/	DTC143TK	AB
Q6305,	98M-XN4213/-1	XN4213	AB
6306,			
6316			
6319			
Q6310,	98M-DTA124EK/	DTA124EK	AB
6327,			
6332			
Q6311,	VS2SD1306//-1	2SD1306	AC
6312,			
6313			
Q6314,	98M-XN4216/-1	XN4216	AB
6315			
Q6328,	VS2SC2712Y/-1	2SC2712Y (VC-H96, VC-H96ETS)	AB
6330,			
6331			
Q6334	VS2SD655DETZ1	2SD655DETZ	AB
Q6335	VS2SD1306//-1	2SD1306	AC

Ref. No.	Part No.	Description	Code
<b>INTEGRATED CIRCUITS</b>			
IC6301	VHIBA7755// -1		AD
IC6303	VHI AN3963FB-1		AU
IC6304	VHI AN3317// -1		AH
IC6306	VHiμPD4053G-1	(VC-H96, VC-H96ETS)	AE
IC6307	VHi M62302FP-1		AN
<b>DIODES</b>			
D6303	98M-HSM2838C/	HSM2838C	AB
6306			
D6312	98M-RD4R3MB3/	Zener Diode (VC-H96, VC-H96ETS)	AB
D6315,	98M-RD5R1MB1/	Zener Diode	AB
6317			
D6316,	98M-HSM2836C/	HSM2836C	AB
6318			
<b>CONTROLS</b>			
R6306	98MVZ066HB504	500k(B) Bias Current Adj. (VC-91, VC-H91ETS)	AC
R6306	98MVZ066LB504	500k(B) Bias Current Adj. (VC-H96, VC-H96ETS)	AC
R6349,	98MVZ066HB203	20k(B) E-E Gain Adj. (VC-H91, VC-H91ETS)	AB
6366		E-E Gain Adj. (VC-H91, VC-H91ETS)	
R6349,	98MVZ066LB203	20k(B) E-E Gain Adj. (VC-H96, VC-H96ETS)	AB
6366		E-E Gain Adj. (VC-H96, VC-H96ETS)	
<b>TRIMMING RESISTORS</b>			
R6367A,	98MCR18-511MT	510 ohm NTSC FM Carrier Adj.	AA
6370A,		NTSC FM Carrier Adj.	
6371A		PAL FM Carrier Adj.	
R6367B,	98MCR18-392MT	3.9k ohm NTSC FM Carrier Adj.	AA
6370B		NTSC FM Carrier Adj.	
R6368A	98MCR18-203MT	20k ohm PAL FM Carrier Adj. (VC-H91, VC-H91ETS)	AA
R6368A	98MCR18-243MT	24k ohm PAL FM Carrier Adj. (VC-H96, VC-H96ETS)	AA
R6368B	98MCR18-302MT	3k ohm PAL FM Carrier Adj.	AA

H91/H91ETS  
H96/H96ETS  
H980/H980ETS

Ref. No.	Part No.	Description	Code
R6371B	98MCR18-103MT	10k ohm PAL FM Carrier Adj.	AA

#### FILTER, COILS AND TRANSFORMERS

L6301	98MEL66RA221K	220μH	AB
L6302	98M-L03VB820K	82μH	AB
L6303	98MEL67RA682K	6.8mH	AB
FL6301	RCiLi0060GEZZ	Filter, 70kHz	AD
T6301	RTRNH0053GEZZ	Bias Osc.	AE

#### CAPACITORS

C2412	98MECEA1CN100	10μF, 16V, Electrolytic (N.P.) (VC-H96, VC-H96ETS)	AB
C6305	98MECQP1-562J	5600pF, 100V, 5%, Polypro Film	AD
C6328, 6343, 6360	98MECEA1AU101	100μF, 10V, Electrolytic	AB
C6388	98MECEA1HNR22	0.22μF, 50V, Electrolytic (N.P.) (VC-H96, VC-H96ETS)	AB
C6391	98MECEA1CU101	100μF, 16V, Electrolytic (VC-H96, VC-H96ETS)	AB

#### RESISTORS

R6304, 6442	VRG-SC2EB4R7J	4.7 ohm, 1/4W, 5%, Fuse Resistor	AB
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#### MISCELLANEOUS

98MILS-2P-S2T	Plug, 2 pin (TP6301-6302)	AA
98MILS-4P-S2L	Plug, 4 pin (TP6303-6306) (VC-H91, VC-H91ETS)	AB
98MILS-4P-S2T	Plug, 4 pin (TP6303-6306) (VC-H96, VC-H96ETS)	AB
98MJST12MQ-ST	Socket, 12 pin (BA, BB, BD)	AD
98MJST08MQ-ST	Socket, 8 pin (BC)	AC
98MJST05MQ-ST	Socket, 5 pin (BE)	AC
98MB6B-PH-K-S	Plug, 6 pin (BF)	AB
98MB4B-PH-K-S	Plug, 4 pin (BG)	AB
98MB2B-PH-K-S	Plug, 2 pin (BI)	AA

#### Hi-Fi CIRCUIT

RUNTK0732GEZZ	Hi-Fi Board Assembly (VC-H980, VC-H980ETS)	—
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Ref. No.	Part No.	Description	Code
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#### TRANSISTORS

Q6023, 6103, 6322	VS2SA1162Y/-1	2SA1162Y	AB
Q6024, 6102	98M-DTC124EK/	DTC124EK	AB
Q6101	VS2SD1306//-1	2SD1306	AC
Q6104	VS2SC2712Y/-1	2SC2712	AB
6107, 6115, 6118, 6119, 6121, 6122, 6321, 6325			
Q6108	98M-DTC143TK/	DTC143TK	AB
6113, 6304			
Q6114	98M-DTA124EK/	DTA124EK	AB
6116, 6310, 6327, 6332			
Q6117	98M-DTC363TK/	DTC363TK	AC
Q6120, 6303, 6307, 6308, 6309, 6323, 6333	98M-DTC144EK/	DTC144EK	AB
Q6301	VS2SC3939R/-1	2SC3939R	AD
Q6302	98M-DTC363TK/	DTC363TK	AC
Q6305, 6306, 6316	98M-XN4213/-1	XN4213	AB
6319			
Q6311, 6312, 6313	VS2SD1306//-1	2SD1306	AC
Q6314, 6315	98M-XN4216/-1	XN4216	AB
Q6320	VS2SC2001LK-1	2SC2001LK	AA
Q6324	VS2SB1413//-1	2SB1413	AE

#### INTEGRATED CIRCUITS

IC6001	VHiYSS205//-1	BF
IC6002	RH-iX1799CEZZ	AT

Ref. No.	Part No.	Description	Code
IC6003	VHiPST529D2-1		AD
IC6004	RH-iX0840GEZZ		AT
IC6005,	VHiXR15218F-1		AC
6101,	or		
6103,	VHiM5218AFP-1		AD
6104,			
6105			
IC6102	VHiPC4570G-1		AD
IC6106	VHiXRU4053F-1		AE
IC6107	VHiM62302FP-1		AN
IC6301	VHiBA7755//-1		AD
IC6303	VHiAN3963FB-1		AU
IC6304	VHiAN3317//-1		AH
IC6305	VHiPP005RF11		AE

DIODES			
D6001,	98M-HSM2836C/	HSM2836C	AB
6004,			
6005			
D6002,	98M-HSM123///	HSM123	AB
6003			
D6006,	98M-HSM2838C/	HSM2838C	AB
6007,			
6101			
6104,			
6106,			
6107,			
6303			
6306,			
6309,			
6310,			
6311			
D6105,	98M-RD2R0MB//	RD2.0MB	AB
6108			
D6307	98M-RD5R6MB3/	RD5.6MB3	AB
D6308	98M-RD10R0MB2	RD10.0MB2	AB

CONTROLS			
R6306 -	98MVZ066HB504	500k(B) Bias Current Adj.	AC
R6349,	98MVZ066HB203	20k(B) E-E Gain Adj.	AB
6366		E-E Gain Adj.	

TRIMMING RESISTORS			
R6367A,	98MCR18-511MT	510 ohm	AA
		NTSC FM Carrier Adj.	
6370A,		NTSC FM Carrier Adj.	
6371A		PAL FM Carrier Adj.	

Ref. No.	Part No.	Description	Code
R6367B,	98MCR18-392MT	3.9k ohm	AA
		NTSC FM Carrier Adj.	
6370B		NTSC FM Carrier Adj.	
R6368A	98MCR18-203MT	20k ohm	AA
		PAL FM Carrier Adj.	
R6368B	98MCR18-302MT	3k ohm	AA
		PAL FM Carrier Adj.	
R6371B	98MCR18-103MT	10k ohm	AA
		PAL FM Carrier Adj.	

FILTERS, CRYSTALS, COILS AND TRANSFORMERS			
L6001	98MEL45RA470K	47μH	AB
L6301	98MEL66RA221K	220μH	AB
L6302	98MEL66RA101K	100μH	AC
L6303	98MEL67RA682K	6.8mH	AB
FL6001,	RFILN0041GEZZ	Filter	AB
6002,			
6003			
FL6101,	RCiLF0240GEZZ	Filter	AE
6102			
FL6301	RCiLi0060GEZZ		AD
T6301	RTRNH0053GEZZ	Bias Osc.	AE
X6001	RCRSB0153GEZZ	Crystal	AG
X6002	RFILC0073GEZZ		AD

CAPACITORS			
C6010	98MECEA1AK221	220μF, 10V, Electrolytic	AB
C6011,	98MECEA1AK101	100μF, 10V, Electrolytic	AB
6017			
C6145,	98MECEA1CN100	10μF, 16V, Electrolytic	AB
6146,		(N.P.)	
6148			
C6328,	98MECEA1AU101	100μF, 10V, Electrolytic	AB
6343,			
6360			

MISCELLANEOUS			
98MB2B-PH-K-S	Plug, 2 pin (TP6301-6302)		AA
98MiLS-4P-S2L	Plug, 4 pin (TP6303-6306)		AB
98MJST12MQ-ST	Socket, 12 pin (RA, BB, BD)		AD
98MJST08MQ-ST	Socket, 8 pin (BC, BE)		AC
98MB6B-PH-K-S	Socket, 6 pin (BF)		AB
98MB4B-PH-K-S	Socket, 4 pin (BG)		AB
98MS11B-PH-K	Socket, 11 pin (BH)		AB
98MB2B-PH-K-S	Socket, 2 pin (BI)		AA



Ref. No.	Part No.	Description	Code	Ref. No.	Part No.	Description	Code
<b>TERMINAL CIRCUIT</b>				<b>DIODES AND CRYSTALS</b>			
	DUNTK3998TM52	Terminal Board Assembly (VC-H91, VC-H91ETS)	—	D5901, 5902	VHD1SS152// -1	1SS152	AB
	DUNTK3998TM50	Terminal Board Assembly (VC-H96, VC-H96ETS)	—	D5903, 5904,	VHD1SS119// -1	1SS119 (VC-H96, VC-H96ETS, VC-H980)	AB
	DUNTK3998TM54	Terminal Board Assembly (VC-H980)	—	5905,		(VC-H96, VC-H96ETS, VC-H980)	
	DUNTK3998TM55	Terminal Board Assembly (VC-H980ETS)	—	5906,		(VC-H96, VC-H96ETS, VC-H980)	
				5907			
				X5901	RCRSB0085GEZZ	Crystal, 14MHz	AG
				X5902	RCRSB0089GEZZ	Crystal, 17MHz	AG
<b>TRANSISTORS</b>				<b>CONTROL</b>			
Q5901, 5905, 5907, 5909, 5910, 5916, 5917	VS2SA733APQ1E	2SA733APQ	AC	R5912	RVR-M4626GEZZ	10k(8) AFC Adj.	AB
Q5902, 5903, 5904, 5911,	VSUN2213/// -1	UN2213 (VC-H96, VC-H96ETS, VC-H980, VC-H980ETS)	AA	<b>COILS AND FILTERS</b>			
5920				FL5901	RFILN0013GEZZ	Filter	AC
Q5906	VSBC847B1F/-1	BC847B1F	AA	FL5902	RFILC0115GEZZ	Filter, 4.0 MHz	AC
Q5908, 5918	VSKRC104M/// -1	KRC104M	AA		or	(VC-H96, VC-H96ETS, VC-H980)	
Q5912	VSUN2113/// -1	UN2113 (VC-H96, VC-H96ETS, VC-H980, VC-H980ETS)	AA		RFILC0118GEZZ	VC-H980)	AC
Q5913, 5914,	VS2SD1306-E1E	2SD1306 (VC-H96, VC-H96ETS, VC-H980, VC-H980ETS)	AD	L5901, 5920	VP-XF220K0000	22μH	AB
5915		(VC-H96, VC-H96ETS, VC-H980, VC-H980ETS)		L5902, 5903	VP-XF101K0000	100μH	AB
		(VC-H96, VC-H96ETS, VC-H980, VC-H980ETS)					
		(VC-H96, VC-H96ETS, VC-H980, VC-H980ETS)		5905, 5908			
		(VC-H96, VC-H96ETS, VC-H980, VC-H980ETS)		L5906	VP-XF221K0000	220μH	AB
		(VC-H96, VC-H96ETS, VC-H980, VC-H980ETS)		L5907	VP-XF120K0000	12μH	AB
				<b>TRIMMER</b>			
				C5901	RTO-H1034GEZZ	Character Position Adj.	AD
<b>INTEGRATED CIRCUITS</b>				<b>CAPACITORS</b>			
IC5901	RH-IX0843GEZZ		AS	C5907	VCEAEA0JW107M	100μF, 6.3V, 20%, Electrolytic	AB
IC5902	VHILVA519S2-1		AH	C5910, 5930	VCEA2A0JW477M	470μF, 6.3V, 20%, Electrolytic	AB
IC5903	VHITC4S66F/-1		AD	C5912	RC-QZA561TAYJ	560pF, Mylar	AB
IC5904	VHIPST529D2-1	(VC-H96, VC-H96ETS, VC-H980)	AD	C5913	RC-QZA222TAYJ	0.0022μF, Mylar	AB
IC5905	RH-IX0841GEZZ	(VC-H96, VC-H96ETS, VC-H980)	AS	C5914	VCFYSA1HB223J	0.022μF, 50V, 5%, Mylar	AA
				C5916	VCE9EA1HW105M	1μF, 50V, 20%, Electrolytic (N.P.)	AC

Ref. No.	Part No.	Description	Code
C5919	VCE9EA1CW476M	47 $\mu$ F, 16V, 20%, Electrolytic (N.P.)	AC
C5927	VCEAEA1CW107M	100 $\mu$ F, 16V, 20%, Electrolytic	AC
C5950	VCFYSA1HB473J	0.047 $\mu$ F, 50V, 5%, Mylar (VC-H96, VC-H96ETS, VC-H980)	AA

#### MISCELLANEOUS

	QPLGZ0352GEZZ	Plug, 3 pin (TP5901-5903)	AA
	QPLGZ1040GEZZ	Plug, 10 pin (JA, JB, JC, JD)	AD
	QSOCZ1241GEZZ	Socket, 12 pin (JE, JF)	AC
FB5901	RBLN-0043CEZZ	Ferrite Bead	AB
J6601	QJAKL0001GEZZ	Jack	AK
S5901, 5903	QSW-S0244GEZZ	Switch, NTSC Select	AE
S5902,	QSW-S0243GEZZ	Switch, (VC-H91, VC-H91ETS)	AD
5904		Switch, Audio Out Control (VC-H980, VC-H980ETS)	
5905		Switch, ATT	

#### TUNER / IF CIRCUIT

	DUNTK3997TM52	Tuner / IF Board Assembly (VC-H91, VC-H91ETS)	—
	DUNTK3997TM50	Tuner / IF Board Assembly (VC-H96, VC-H980)	—
	DUNTK3997TM57	Tuner / IF Board Assembly (VC-H96ETS)	—
	DUNTK3997TM55	Tuner / IF Board Assembly (VC-H980ETS)	—

#### TRANSISTORS

Q1501 1502, 1503, 1511, 1512	VSUN2213///-1	UN2213  (VC-H96, VC-H96ETS, VC-H980, VC-H980ETS) (VC-H96, VC-H96ETS, VC-H980, VC-H980ETS)	AA
Q1504, 1507, 1508, 1509	VSBC847B1F/-1	BC847B1F	AA
Q1510	VSUN2113///-1	UN2113	AA
Q1514	VS2SD1757KS-1	2SD1757KS	AC

Ref. No.	Part No.	Description	Code
<b>INTEGRATED CIRCUITS</b>			
IC1501	VHITA7348P/-1		AK
IC1502	RH-iX0203GEZZ		AE
IC1503	VHIBA15218N-1	(VC-H96, VC-H96ETS, VC-H980, VC-H980ETS)	AD

#### DIODES

D1502,	VHD15S119// -1	15S119 (VC-H96, VC-H96ETS, VC-H980, VC-H980ETS)	AB
1503,		(VC-H96, VC-H96ETS, VC-H980, VC-H980ETS)	
1506, 1507			

#### COILS

L1504, 1507	VP-DF221K0000	220 $\mu$ H (VC-H96, VC-H96ETS, VC-H980, VC-H980ETS)	AB
L1505, 1506, 1509	VP-DF220K0000	22 $\mu$ H  (VC-H96, VC-H96ETS, VC-H980, VC-H980ETS)	AB

#### CAPACITORS

C1507	VCFYSA1HB334J	0.33 $\mu$ F, 50V, 5%, Mylar	AB
C1515	VCE9EA1CW226M	22 $\mu$ F, 16V, 20%, Electrolytic (N.P.)	AC
C1530	VCFYSA1HB153J	0.015 $\mu$ F, 50V, 5%, Mylar	AA
C1531	VCFYSA1HB103J	0.01 $\mu$ F, 50V, 5%, Mylar	AA

#### MISCELLANEOUS

	RiFU-0621GEZZ	IF-PACK	BE
	RCNVR0112GEZZ	RF-Converter	BD
	VTUOF4EO-725/	Tuner (VC-H96, VC-H96ETS, BC VC-H980, VC-H980ETS)	
	VTUVTSS6S2Z//	Tuner (VC-H91, VC-H91ETS)	BA
FB1501, 1502	RBLN-0043CEZZ	Ferrite Bead	AB
	QPLGN0978GEZZ	Plug, 9 pin (IC) (VC-H91, VC-H91ETS)	AC
	QPLGN1278GEZZ	Plug, 12 pin (IC) (VC-H96, VC-H96ETS, VC-H980, VC-H980ETS)	AC

Ref. No.	Part No.	Description	Code	Ref. No.	Part No.	Description	Code
<div>QPLGZ0842GEZZ Plug, 8 pin (ID, IE, IF (VC-H96, VC-H96ETS, VC-H980, VC-H980ETS)) AC</div> <div>QPLGZ1242GEZZ Plug, 12 pin (IA, IB, IG (VC-H96, VC-H96ETS, VC-H980 VC-H980ETS)) AD</div>				<div>FILTER, COILS AND TRANSFORMER</div> <div>L1601, VP-DF120K0000 12μH AB</div> <div>1602</div> <div>L1603 VP-XF1R8K0000 1.8μH AB</div> <div>L1604, VP-DF100K0000 10μH (VC-H980ETS) AB</div> <div>1605</div> <div>SF1601 RFILC0125GEZZ Filter AP</div> <div>T1601 RCILD0057GEZZ Detection Coil AE</div> <div>T1602, RCILi0086GEZZ (VC-H980ETS) AE</div> <div>1603 (VC-H980ETS)</div> <div>FL1602 RFILC0061CEZZ (VC-H980ETS) AF</div> <div>FL1603 RFILC0063CEZZ (VC-H980ETS) AG</div>			
<div>SIF/MPX CIRCUIT</div> <div>DUNTK3999TM50 SIF/MPX Board Assembly (VC-H96, VC-H96ETS, VC-H980) —</div> <div>DUNTK3999TM52 SIF/MPX Board Assembly (VC-H980ETS) —</div>				<div>CAPACITOR</div> <div>C1621 VCEA2A1CW227M 220μF, 16V, 20%, Electrolytic (VC-H980ETS) AB</div>			
<div>TRANSISTORS</div> <div>Q1601, VS25C2735//1E 25C2735 AC</div> <div>1602,</div> <div>1604</div> <div>Q1603, VS25C2712Y/-1 25C2712Y AB</div> <div>1605</div> <div>Q1606, VSBC847B1F/-1 BC847B1F AA</div> <div>1607</div>				<div>RESISTOR</div> <div>R1645 VRG-SC2EB220J 22 ohm, 1/4W, 5%, Fuse Resistor AB</div>			
<div>INTEGRATED CIRCUIT</div> <div>IC1601 VHITDA3857/-1 AR</div> <div>IC1602 VHITDA8415/-1 (VC-H980ETS) AW</div>				<div>MISCELLANEOUS</div> <div>QSOCZ0841GEZZ Socket, 8 pin (FA, FB) AC</div> <div>QPLGN0229TAZZ Plug, 2 pin (TP1601-1602) AB</div> <div>(VC-H980ETS)</div>			
<div>DIODE AND CRYSTAL</div> <div>D1603 RH-EX0642GEZZ Zener Diode AA</div> <div>X1601 RCRS0129GEZZ Crystal (VC-H980ETS) AG</div>				<div>NICAM CIRCUIT</div> <div>DUNTK4000TM50 NICAM Board Assembly (VC-H96, VC-H96ETS) —</div> <div>DUNTK4000TM51 NICAM Board Assembly (VC-H980) —</div> <div>DUNTK4000TM52 NICAM Board Assembly (VC-H980ETS) —</div>			
<div>CONTROLS</div> <div>R1632, RVR-M4622GEZZ 2k(B) Audio Level Adj. (VC-H980ETS) AB</div> <div>1633 2k(B) Separation Adj. (VC-H980ETS)</div>				<div>TRANSISTORS</div> <div>Q1701, VSBC847B1F/-1 BC847B1F AA</div> <div>1703, (VC-H96, VC-H96ETS)</div> <div>1708</div> <div>Q1702, VS25C2735//1E 25C2735 AC</div> <div>1704 (VC-H96, VC-H96ETS)</div>			

Ref. No.	Part No.	Description	Code
Q1705,	VSUN2112///-1	UN2112 (VC-H96, VC-H96ETS)	AA
1706,		(VC-H96, VC-H96ETS, VC-H980ETS)	
1707		(VC-H96, VC-H96ETS, VC-H980ETS)	
Q1709	VS2SC945APQ1E	2SC945APQ	AB

### INTEGRATED CIRCUITS

IC1701	VH1TB1204F/-1		BK
IC1702	VH1TA2009F/-1		AH
IC1703,	VH1TC4W53F/-1	(VC-H96, VC-H96ETS)	AE
1704,		(VC-H96, VC-H96ETS)	
1705		(VC-H96, VC-H96ETS)	

### DIODE AND CRYSTALS

D1701	VHD1SS119// -1	1SS119	AB
X1701	RCRSB0130GEZZ	Crystal (VC-H96, VC-H96ETS)	AK
X1702	RCRSB0132GEZZ	Crystal (Except VC-H980ETS)	AK
X1702	RCRSB0130GEZZ	Crystal (VC-H980ETS)	AK
X1703	RCRSB0131GEZZ	Crystal, 11.648MHz	AH

### CONTROLS

R1723,	RVR-M4386GEZZ	470k(B) (VC-H96, VC-H96ETS)	AB
1724			

### COILS AND FILTERS

FL1701	RCILV0095GEZZ	(VC-H980ETS)	AH
FL1701	RCILV0165CEZZ	(Except VC-H980ETS)	AT
FL1702	RCILV0096GEZZ	(VC-H96, VC-H96ETS)	AN
FL1703	RFILN0013GEZZ		AC
L1701,	VP-DF120K0000	12μH	AB
1704		(VC-H96, VC-H96ETS)	
L1703,	VP-XF680K0000	68μH	AB
1706		(VC-H96, VC-H96ETS)	
L1707,	VP-DF102J0000	1mH	AB
1708			

### CAPACITORS

C1716,	VCFYSA1HB473J	0.047μF, 50V, 5%, Mylar	AA
1717			

Ref. No.	Part No.	Description	Code
C1733,	VCE9EA1CW106M	10μF, 16V, 20%, Electrolytic (N.P.)	AC
1734			
C1742,	RC-QZA152TAYJ	1500pF, Mylar	AB
1743			
C1762	VCFYSA1HB184J	0.18μF, 50V, 5%, Mylar	AB

### MISCELLANEOUS

QPLGN0329TAZZ	Plug, 3 pin (TP1701-1703)	AB
QSOCZ0841GEZZ	Socket, 8 pin (EA)	AC
QSOCZ1241GEZZ	Socket, 12 pin (EB)	AC

### SECAM CHROMA CIRCUIT

DUNTK4007TM50	SECAM Chroma Board Assembly (VC-H91, VC-H91ETS)	—
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### TRANSISTORS

Q5301	VS2SC2001LK-1	2SC2001LK	AA
Q5302,	VSBC847B1F/-1	BC847B1F	AA
5311,			
5313,			
5314			
Q5303	VS2SA733APQ1E	2SA733APQ	AC
Q5304,	VSBA857B3F/-1	BA857B3F	AA
5308			
Q5307	VSUN2213///-1	UN2213	AA
Q5309,	VS2SC945APQ1E	2SC945APQ	AB
5310			
Q5312	VS2SD655-DE1E	2SD655-DE	AC

### INTEGRATED CIRCUIT

IC5301	VH1BA7107S/-1	AS
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### DIODES

D5301	RH-EX0617GEZZ	Zener Diode	AA
D5302,	VHD1SS119// -1	1SS119	AB
5303			

### PACKAGED CIRCUITS

FL5301,	RMPTD0257GEZZ		AD
5302			
FL5305	RMPTD0223GEZZ		AE

H91/H91ETS  
H96/H96ETS  
H980/H980ETS

Ref. No.	Part No.	Description	Code
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### CONTROLS

R5310,	RVR-M5446GEZZ	6.8k(B) Sync Gate Adj. -A	AB
5311		Sync Gate Adj. -B	
R5348	RVR-B5442CEZZ	1.5k(B) REC-C Adj.	AB

### COILS AND FILTERS

FL5303	RCILV0078GEZZ		AD
FL5304	RCILV0077GEZZ		AD
FL5306	RCILV0079GEZZ		AD
L5301,	VP-DF101K0000	100μH	AB
5308			
L5302	VP-DF391K0000	390μH	AC
L5303	VP-MK221K0000	220μH	AB
L5304	VP-XF390K0000	39μH	AB
L5305	VP-MK471K0000	470μH	AB
L5306	VP-XF560K0000	56μH	AB
L5307	VP-XF121K0000	120μH	AB
L5309	VP-MK271K0000	270μH	AB

### CAPACITORS

C5311	RC-QZA682TAYJ	0.0068μF, Mylar	AB
C5312	RC-QZA471TAYJ	470pF, Mylar	AB

### MISCELLANEOUS

QPLGN1278GEZZ	Plug, 12 pin (SC)	AC
QSOCZ0841GEZZ	Socket, 8 pin (SA, SB)	AC

### TIMER CIRCUIT

RUNTK0740GEZZ	Timer Board Assembly	—
	(VC-H91, VC-H91ETS)	
RUNTK0739GEZZ	Timer Board Assembly	—
	(VC-H96)	
RUNTK0758GEZZ	Timer Board Assembly	—
	(VC-H96ETS)	
RUNTK0745GEZZ	Timer Board Assembly	—
	(VC-H980)	
RUNTK0759GEZZ	Timer Board Assembly	—
	(VC-H980ETS)	

### TRANSISTORS

Q5001	VS2SA1561Q/1E	2SA1561Q	AC
Q5002	VSDTC124ELT-1	DTC124ELT	AA

Ref. No.	Part No.	Description	Code
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Q5003	VSDTC144ELT-1	DTC144ELT (VC-H980, VC-H980ETS)	AB
Q5004	VSDTA144ELT-1	DTA144ELT	AB

### INTEGRATED CIRCUITS

IC5001	RH-IX0827GEZZ		AW
IC5002	VHiPST529i2-1		AD
IC5003	VHiCAT93C46-1		AN
IC5080	VHiCXA1261M-1		AE

### DIODES AND CRYSTAL

D5001	RH-DX0053GEZZ		AA
	or		
5005,	RH-DX0048GEZZ		AA
5007,	or		
5010,	VHD1SS119//-1	1SS119	AB
5011,			
5012,			
5016			
D5013	RH-EX0630GEZZ	MTZJ9.1B	AA
D5014	RH-PX0204GEZZ	Photodiode	AB
D5080	9CUH-PX0001KD	Photodiode	AD
X5001	RCSR80090GEZZ	Crystal, 32.768kHz	AE

### COIL AND FILTER

L5001	VP-DF220K0000	22μH	AB
FL5001	RFILC0118GEZZ	Filter	AC

### PACKAGED CIRCUIT

R5001	RMPTC0157GEZZ	47k ohm x 4	AA
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### CONTROL

R5018	RVR-B4262GEZZ	10k(B) Picture Tone	AD
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### CAPACITORS

C5006	RC-EZ0390GEZZ	0.047F, 6.3V, Electrolytic	AF
C5011	VCEAEA0JW227M	220μF, 6.3V, 20%, Electrolytic	AC

Ref. No.	Part No.	Description	Code
<b>RESISTOR</b>			
R5082	VRN-RA2BK224F	220k ohm, 1/8W, 1%, Carbon	AA
<b>MISCELLANEOUS</b>			
DG5001	VVKBJ077 GK/-1	Fluorescent Display Tube	AW
	9CUPLGZ0302KD	Plug, 3 pin (TJ)	AA
	9CUSOCN2801KD	Socket, 28 pin (TA)	AC
	9CUSOCN1501KD	Socket, 15 pin (TB)	AB
S5001,	QSW-K0079GEZZ	Switch, Next	AB
5002,		Switch, Channel Set	
5005,		Switch, Rewind	
5006,		Switch, Playback	
5007,		Switch, Fast Forward	
5008,		Switch, Stop	
5009,		Switch, Pause	
5010,		Switch, Recording	
5011,		Switch, Channel Up	
5012,		Switch, Channel Down	
5013,		Switch, Store	
5015,		Switch, Power	
5016,		Switch, Eject	
5017,		Switch, Timer	
5018,		Switch, Menu	
5020,		Switch, Clear	
5021		Switch, All Clear	
S5022,	QSW-S0245GEZZ	Switch, VCR/Bass/ Normal/Low (VC-H980, VC-H980ETS)	AF
5023		Switch, Auto/PAL/ NTSC/SECAM	
S5024	-QSW-S0244GEZZ	Switch, Edit/Normal/AI	AE
<b>RELAY CIRCUIT</b>			
	DUNTK4001TM52	Relay Board Assembly (VC-H91, VC-H91ETS)	—
	DUNTK4001TM50	Relay Board Assembly (VC-H96, VC-H96ETS, VC-H980, VC-H980ETS)	—
<b>TRANSISTORS</b>			
Q1451	VS25C945APQ1E	25C945APQ	AB
Q8501	VS25C2001LK-1	25C2001LK	AA
<b>INTEGRATED CIRCUIT</b>			
IC1451	VHIUPC574JT-1		AC

Ref. No.	Part No.	Description	Code
<b>DIODES</b>			
D8501	RH-DX0053GEZZ	1SS132	AA
D9001	RH-EX0281CEZZ	HZS7.5EB1	AA
<b>COIL</b>			
L1451	VP-XF120K0000	12μH	AB
<b>CAPACITORS</b>			
C1451,	VCFYSA1HB334J	0.33μF, 50V, 5%, Mylar	AB
1452			
C8501	VCEAGA1EW227M	220μF, 25V, 20%, Electrolytic	AC
<b>MISCELLANEOUS</b>			
	QPLGN0978GEZZ	Plug, 9 pin (RE) (VC-H91, VC-H91ETS)	AC
	QPLGN1178GEZZ	Plug, 11 pin (RB)	AC
	QPLGN1278GEZZ	Plug, 12 pin (RE) (VC-H96, VC-H96ETS, VC-H980, VC-H980ETS)	AC
	QSOCN0595GEZZ	Socket, 5 pin (RH)	AB
	QSOCN1571REZZ	Socket, 15 pin (RI)	AC
	QSOCN1595GEZZ	Socket, 15 pin (RC, RG)	AC
	QSOCN2295GEZZ	Socket, 22 pin (RD, RF)	AD
	QSOCN2871REZZ	Socket, 28 pin (RA)	AD
<b>POWER CIRCUIT</b>			
	RDENC0522GEZZ	Power Board Assembly	—
<b>TRANSISTOR</b>			
△Q901	95KUAD0046AZ	2SD882	AH
<b>INTEGRATED CIRCUIT</b>			
△IC901	95KUCC0042AZ		AR
<b>DIODES</b>			
△D901	95KUBC0213FK	RL156	AC
△ 904			

Ref. No.	Part No.	Description	Code
△D905	95KUBC0214BK	R1200F	AC
△D906,	95KUBC0178AB	D1NL20	AD
△ 907	or		
	95KUBC0221AK	ERA18	AC
	or		
	95KUBC0169EZ	ERA22	AD
△D908	95KUBA0005KZ	1S555	AB
△D909	95KUBC0143AK	EU1Z	AC
△D910	95KUBC0250AK	5ELS2	AC
△D911	95KUBC0247BK	1JU42	AC
△D912,	95KUBC0171BC	30DF2	AF
△ 913			
△D914	95KUBC0182CK	10ELS4	AC
△D915	95KUBDAK180C	RD18ESAB	AB
△D916	95KUDA0064AK	RSF05G1	AD
△D917	95KUBC0017BK	10DF2	AD

#### CONTROL

△R916	95KUFBA202CD	2k ohm, UR6.5V Adj.	AC
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#### COILS AND TRANSFORMER

△L901	95KUKZ0306ZZ	ELF-18D290C, Line Filter	AK
L902	95KUKZ0256ZZ	100μH, Inductance Coil	AC
L903	95KUKZ0316ZZ	62μH, Filter	AE
L904	95KUKZ0416ZB	68μH, Inductance Coil	AE
L905	95KUKZ0315ZZ	33μH, Filter	AD
△L906	95KUKZ0469ZK	100μH, Inductance Coil	AE
△ 907			
△T901	95K129035052	PTTP59, Pulse Transformer	AX

#### CAPACITORS

△C901	95KUGZ0687ZZ	0.1μF, Film	AB
	or		
	95KUGFZ104FE		AE
△C902	95KUGZ0662ZZ	0.047μF, Film	AE
	or		
	95KUGFZ473FE		AE
△C903	95KUGCZ102BP	1000pF, 4kV, Ceramic	AD
△C904,	95KUGCZ471BT	470pF, 4kV, Ceramic	AC
△ 905			
△C907	95KUGCU101AJ	100pF, 1kV, Ceramic	AC
	or		
	95KUGCU101BH		AB
△C908	95KUGBQ680BT	68μF, 400V, Electrolytic	AP
△C909	95KUGAJ100JS	10μF, 100V, Electrolytic	AC
△C910	95KUGAQ010LM	1μF, 400V, Electrolytic	AD
△C911	95KUGZ0779ZZ	47pF, 1kV, Ceramic	AC
	or		
	95KUGCU470BG		AB

Ref. No.	Part No.	Description	Code
△C912	95KUGAB220HV	22μF, 10V, Electrolytic	AE
△C913	95KUGFJ222EL	2200pF, 100V, Film	AB
△C914	95KUGFF333BQ	0.033μF	AB
△C915	95KUGAC101FD	100μF, 16V, Electrolytic	AC
△C916	95KUGAC100HV	10μF, 16V, Electrolytic	AF
△C917	95KUGCS471AA	470pF, 500V, Ceramic	AB
△C918,	95KUGCS221AA	220pF, 500V, Ceramic	AB
△ 929			
C922	95KUGAB101FD	100μF, 10V, Electrolytic	AB
	or		
	95KUGAB101HN		AB
C923,	95KUGAC271NU	270μF, 16V, Electrolytic	AD
924	or		
	95KUGAC271NV		AD
C926,	95KUGAB391NU	390μF, 10V, Electrolytic	AD
927	or		
	95KUGAB391NV		AD
C931	95KUGAD221NV	220μF, 25V, Electrolytic	AE
	or		
	95KUGAD221NJ		AD

#### RESISTORS

△R901,	95KUEZ0437ZK	6.8M ohm, 1/2W, Solid	AB
△ 902			
△R903	95KUEFG5R6AA	5.6 ohm, 5W, Metal Film	AD
△R904	95KUEBBR39AM	0.39 ohm, Fuse Resistor	AC
△R905	95KUEFCR39AW	0.39 ohm, 1/2W, Metal Film	AA
△R906	95KUEEC273AT	27k ohm, 1/2W, Carbon	AA
△ 910			
△R911	95KUEEC683AT	68k ohm, 1/2W, Carbon	AA
△ 914	95KUEEC683AM		AA
△R915	95KUEEB151BF	150 ohm, Carbon	AA
	or		
	95KUEEB151BE		
△R917	95KUEEC180AT	18 ohm, 1/2W, Carbon	AA
△R918	95KUEEB103BF	10k ohm, Carbon	AA
△R919	95KUEBB8R2AV	8.2 ohm, 1/6W, Fuse Resistor	AC

#### MISCELLANEOUS

△F901	95KPJCTB2001	Fuse, T2A, 250V	AD
	or		
	95KPJCAY2001		AD
△F902	95KPJCBB1001	Fuse, 1A, 125V	AE
△F903,	95KPJCBB2001	Fuse, 2A, 125V	AG
△ 904			
	95KPZZ0625ZZ	Fuse Holder	AB
△	95KPCZ0115ZZ	Plug (for AC Cord)	AE
	95KPKZ0451ZZ	Plug, 11 pin (PA)	AD

Ref. No.	Part No.	Description	Code	Ref. No.	Part No.	Description	Code
<b>HEAD AMP CIRCUIT</b>				<b>DIODES</b>			
	DUNTK3721XM52	Head Amp Board Assembly	—	D8101	RH-PX0207GEZZ	Photodiode	AB
				8106, 8107		(VC-H91, VC-H91ETS)	
				D8108	RH-DX0053GEZZ	1SS132	AA
				8109,	or VHD1SS119/-1	1SS119	AB
				8112		(VC-H91, VC-H91ETS)	
<b>INTEGRATED CIRCUIT</b>				<b>MISCELLANEOUS</b>			
IC301	VHiBA7279S/-1		AL		QPLGN0878GEZZ	Plug, 8 pin (HA)	AC
<b>COILS</b>				<b>MIC AMP CIRCUIT</b>			
L301, 307	VP-MK101K0000	100 $\mu$ H	AB		RUNTK0746GEZZ	MIC AMP Board Assembly	—
L399	VP-OF1R5M0000	1.5 $\mu$ H	AC			(VC-H980, VC-H980ETS)	
<b>CAPACITORS</b>				<b>TRANSISTORS</b>			
C307, 310	VCFYSA1HB473J	0.047 $\mu$ F, 50V, 5%, Mylar	AA		Q6801, VSDTC124EK/-1	DTC124EK	AB
C313, 314, 317, 318	RC-KZ0018GEZZ	0.1 $\mu$ F, Ceramic	AA	6803, 6804, 6805, 6806			
C326	VCFYSA1HB333J	0.033 $\mu$ F, 50V, 5%, Mylar	AE	Q6802	VSDTA124EK/-1	DTA124EK	AB
	or VCFYSA1JA333J	0.033 $\mu$ F, 63V, 5%, Mylar	AB	<b>INTEGRATED CIRCUIT</b>			
<b>MISCELLANEOUS</b>				IC6801	VHiUPC4570HA1		AE
	QPLGN0229TAZZ	Plug, 2 pin (TP301-302)	AB	<b>DIODES</b>			
	QPLGN0480GEZZ	Plug, 4 pin (XC)	AB		D6801, RH-DX0053GEZZ	1SS132	AA
	QSOCN1232REZZ	Socket, 12 pin (XA)	AD	6802			
	QSOCN1271REZZ	Socket, 12 pin (XB)	AC	<b>CONTROL</b>			
<b>LED CIRCUIT</b>					R6818	RVR-B4370GEZZ	AG
	RUNTK0741GEZZ	LED Board Assembly	—				
		(VC-H91, VC-H91ETS)					
	RUNTK0735GEZZ	LED Board Assembly	—				
		(VC-H96, VC-H96ETS)					
<b>TRANSISTORS</b>							
Q8101, 8102	VS2SC4038R/1E	2SC4038R	AB				
Q8103	VSDTC144ELT-1	DTC144ELT	AB				



C-H91/H91ETS  
C-H96/H96ETS  
C-H980/H980ETS

Ref. No.	Part No.	Description	Code
<b>MISCELLANEOUS</b>			
	QPLGN1120REZZ	Plug, 11 pin (HB)	AB
	QPLGZ0725GEZZ	Plug, 7 pin (HC)	AC
S6801,	QSW-K0079GEZZ	Switch, Key (-)	AB
6802,		Switch, Key (+)	
6803		Switch, Mode	

<b>MIC JACK CIRCUIT</b>			
	RUNTK0731GEZZ	MIC JACK Board Assembly (VC-H980, VC-H980ETS)	—

<b>MISCELLANEOUS</b>			
J6601	QJAKE0203GEZZ		AF
J6602,	QJAKE0200GEZZ		AF
6603			

<b>INFRARED REMOTE CONTROL CIRCUIT</b>			
	RRMCG0910GESA	Infrared Remote Control Unit (VC-H91, VC-H91ETS)	BD
	RRMCG0909GESA	Infrared Remote Control Unit (VC-H96, VC-H96ETS)	BD
	RRMCG0945GESA	Infrared Remote Control Unit (VC-H980)	BD
	RRMCG0955GESA	Infrared Remote Control Unit (VC-H980ETS)	BK

<b>TRANSISTOR</b>			
Q1	92P3TSN0005T	2SC2411K	AD

<b>INTEGRATED CIRCUIT</b>			
IC1	92P3SQ00562		AX

<b>DIODES AND FILTER</b>			
D1	92P3TSD0007T	DAN202K	AC
4			
LED1	92P3QH00019	SLR932A-1-A	AE
LED2	92P3SL00043	SLP-144B-51	AD
X1	92P3TEF0002T	Ceramic Filter, 455kHz	AG

Ref. No.	Part No.	Description	Code
<b>MISCELLANEOUS</b>			
	92PSSSS218596	SW2 (VC-H96, VC-H96ETS, VC-H980)	AE

<b>CABINET PARTS</b>			
1	92PFA11H0907	Cabinet-A	AS
2	92PFA11H1003	Cabinet-B	AP
3	92PFA11H1103	Cabinet-C	AG
4	92PFA5884601	Infrared Filter	AF
5	92PFA61C5203	Knob	AH
6	92PFA61C5303	Knob (VC-H96, VC-H96ETS, VC-H980)	AF
7	92PFA42C6412	Contact Rubber	AW
8	92PFA62D1119	Indication Plate A (VC-H91, VC-H91ETS)	AS
8	92PFA62D1118	Indication Plate A (VC-H96, VC-H96ETS)	AR
8	92PFA62D1120	Indication Plate A (VC-H980)	AS
8	92PFA62D1122	Indication Plate A (VC-H980ETS)	AR
9	92PFA62D1202	Indication Plate B	AK
10	—	PWB	—
11	92PSRGPJJ008A	Switch	AR
12	92P3ETFD0301	Terminal	AD
13	92P2A391050	Screw	AA
14	92P2A401080	Screw	AA
15	92P2A461080	Screw	AA

<b>THE OTHER PARTS</b>			
△	QACCZ3011GEZZ	AC Cord (VC-H91, VC-H96, VC-H980)	AL
△	QACCV2033GEZZ	AC Cord (VC-H91ETS, VC-H96ETS, VC-H980ETS)	AN
	QCNW-5650GEZZ	75 ohm Coaxial Cable	AK
	QPLGA0011CEZZ	AC Plug, Adapter (VC-H91, VC-H96, VC-H980)	AF
	TiNS-2031GEZZ	Operation Manual (VC-H91, VC-H91ETS)	AS
	TiNS-2004GEZZ	Operation Manual (VC-H96, VC-H96ETS)	AS
	TiNS-2056GEZZ	Operation Manual (VC-H980)	AS
	TiNS-2065GEZZ	Operation Manual (VC-H980ETS)	AY
	UBATU0023GEZZ	Battery	AD

Ref. No.	Part No.	Description	Code	Ref. No.	Part No.	Description	Code
<b>MECHANISM CHASSIS PARTS</b>							
1	PGIDS0023GEFW	Retaining Guide	AE	51	MLEVP0134GEZZ	Tension Adjusting Lever	AC
2	MSPRC0142GEFJ	Retaining Guide Spring	AA	52	MLEVP0195GEZZ	Tension Release Lever	AC
3	MLEVC0022GEZZ	Half-Loading Lever	AF	53	MLEVP0132GEZZ	Back Tension Lever	AC
4	MSPRT0270GEFJ	Half-Loading Lever Spring	AA	54	MSPRT0273GEFJ	Back Tension Lever Spring	AB
5	MLEVF0284GEFW	Half-Loading Drive Lever	AC	55	NDAiV1047GEZZ	Supply Reel Disk Ass'y	AH
6	MSPRT0269GEFJ	Half-Loading Reciprocating Spring	AA	56	MSPRT0272GEFJ	Main Brake Spring	AC
7	MLEVF0283GEZZ	Half-Loading Reciprocating Lever	AB	57	MLEVP0135GEZZ	Intermediate Lever	AC
8	MSPRC0144GEFJ	Azimuth Spring	AA	58	MLEVP0129GEZZ	Main Take-Up Brake Lever	AE
9	RHEDU0070GEZZ	Audio/Control Head Ass'y	AS	59	MLEVP0128GEZZ	Main Supply Brake Lever	AE
10	PCAPS1015GEZZ	Retaining Guide Cap	AA	60	NGERH1121GEZZ	Loading Relay Gear	AA
11	QPWBF3777GEZZ	Audio/Control Head PWB	AB	61	MSPRT0271GEFJ	Loading Reciprocating Spring	AA
12	MLEVF0292GEZZ	Audio/Control Head Arm	AD	62	NGERH1120GEZZ	Take-Up Loading Gear	AA
13	MSPRD0087GEFJ	Audio/Control Head Arm Spring	AA	63	MLEVF0304GEZZ	Take-Up Loading Arm Ass'y	AC
14	LHLDZ1606GEZZ	Loading Block Holder Ass'y	AC	64	NGERH1119GEZZ	Supply Loading Gear	AA
15	QPRBF3817GEZZ	Loading Block PWB	AD	65	MLEVF0303GEZZ	Supply Loading Arm Ass'y	AC
16	RMOTM1049GEZZ	Loading Motor	AM	66	LCHSM0123GEZZ	Main Chassis Ass'y	AT
17	QPLGN0580GEZZ	Plug, 5 pin (MG)	AB	67	LBNDK1002GEZZ	Tension Band Ass'y	AD
18	QSW-R0026GEZZ	Cam Switch	AE	68	LHLDZ1607GEZZ	Tension Spring Hook Plate	AA
19	NGERW1032GEZZ	Worm Wheel	AC	69	MSPRT0275GEFJ	Tension Spring	AA
20	NPLYV0133GEZZ	Loading Motor Pulley	AC	70	MLEVF0291GEZZ	Tension Arm Ass'y	AF
21	NBLTK0058GE00	Loading Belt	AA	72	MSLiF0049GEFW	Take-Up Pole Base Slider	AB
22	NGERW1031GEZZ	Worm Ass'y	AC	73	LPOLM0037GEZZ	Take-Up Pole Base Ass'y	AG
23	NSFTG0045GEFJ	Worm Shaft	AB	74	NROLP0062GEZZ	Guide Roller Ass'y	AE
24	NGERH1129GEZZ	Master Cam	AC	75	MSLiF0048GEFW	Supply Pole Base Slider	AB
25	MLEVF0281GEZZ	Pinch Roller Lever Ass'y	AN	76	LPOLM0036GEZZ	Supply Pole Base Ass'y	AG
26	MLEVF0348GEZZ	Relay Shifter Lever	AD	77	PGIDM0066GEZZ	Take-Up Loading Rail	AB
27	MLEVC0033GEZZ	Reverse Guide	AG	78	PGIDM0067GEZZ	Supply Loading Rail	AB
28	MSPRD0086GEFJ	Reverse Guide Spring	AA	79	NSFTL0563GEFW	Supply Impedance Roller Innor	AC
29	RMOTN2038GEZZ	Capstan D.D. Motor	AZ	80	PGIDH0031GEFW	Supply Impedance Roller Flange	AA
30	MLEVP0136GEZZ	Slow Brake Lever	AA	81	NROLP0084GEZZ	Supply Impedance Roller	AC
31	MSPRT0329GEFJ	Slow Brake Spring	AA	82	RHEDT0026GEZZ	Full Erase Head Ass'y	AK
32	MSPRC0151GEFJ	Reverse Guide Spring	AA	83	QPWBF2936GEZZ	Full Erase Head PWB	AA
33	MLEVF0350GEZZ	Relay Gear Drive Lever	AF	84	LANGA0054GEZZ	Supply Reel Retainer Ass'y	AD
34	MSLiF0043GEZZ	Brake Shifter	AK	85	NBLTK0059GE00	Reel Belt	AB
35	NSFTZ0068GEFD	Brake Lock Shaft	AC	86	MLEVP0146GEZZ	Auxiliary Fast-Forward Brake Lever	AE
36	MSPRC0143GEFJ	Absorber Plate Spring	AB	87	MSPRT0282GEFJ	Auxiliary Fast-Forward Brake Spring	AB
37	MSPRT0274GEFJ	Video Search Spring	AB	90	PGIDC0044GEFW	Drum Base	AK
38	MLEVP0181GEZZ	Video Search Brake Lever	AA	91	DDRMW0008HE31	Upper and Lower Drum Ass'y	BW
39	MLEVP0131GEZZ	Video Search Reciprocating Lever	AC	92	QBRSK0025GEZZ	Earth Brush Ass'y	AD
40	RPLU-0083GEZZ	Brake Solenoid Ass'y	AF	93	RMOTP1107GEZZ	Drum D.D. Motor Ass'y	AW
41	NDAiV1046GEZZ	Take-Up Reel Disk Ass'y	AG	97	QCNW-7077GEZZ	Full Flat Cable (Capstan D.D. Motor)	AF
42	NGERH1128GEZZ	Idler Gear Ass'y	AN	98	QCNW-6674GEZZ	Full Flat Cable (Drum D.D. Motor)	AD
43	NPLYV0134GEZZ	Reel Pulley	AC	99	RDTCH0018GEZZ	Dew Sensor	AG
44	MSPRD0085GEFJ	Shifter Spring	AB	100	QSOCN0534REZZ	Socket, 5 pin (MF)	AC
45	PCOVP1018GEZZ	Shifter Spring Cover	AC	101	VRS-TW2ED221J	220 ohm, 1/4W, 5%, Metal Oxide	AA
46	LHLDP1092GEZZ	Cassette LED Holder	AE				
47	RH-PX0180GEZZ	Cassette LED	AD				
48	QPWBF2977GEZZ	Reel Sensor PWB	AK				
49	RH-PX0181GEZZ	Reel Sensor	AE				
50	LCHSS0016GEZZ	Reel Block Chassis	AL				

Ref. No.	Part No.	Description	Code	Ref. No.	Part No.	Description	Code
102	VCKYTV1HB102K	0.001 $\mu$ F, 50V, 10%, Ceramic	AA	325	NBLTK0060GE00	Cassette Loading Belt	AB
103	VRS-TV1JD473J	47k ohm, 1/16W, 5%, Metal Oxide	AA	326	LANGF9354GEFW	Upper Plate	AD
105	LANGA0051GEFW	Take-Up Reel Disk Catch Holder	AB	327	LHLDX1011GE00	Slider Holder (Left)	AB
106	PGIDS0027GEZZ	Supply Impedance Roller Flange L	AA	328	MSPRP0135GEFJ	Cassette Spring	AB
111	LANGF7061GEZZ	Release Pin Angle Ass'y	AC	329	LANGF9357GEFW	Slider Lock (Left)	AA
120	CCHSS0018GE02	Reel Block Ass'y	AZ	330	MSPRT0281GEFJ	Slider Lock Spring	AA
124	LHLDW3009GEZZ	Wire Holder	AA	331	MSLiF0044GEFW	Slider	AF
125	QPLGN0378GEZZ	Plug, 3 pin (MR)	AB	332	MLEVP0137GE00	Lock Release Lever	AA
126	QPLGN0578GEZZ	Plug, 5 pin (MH)	AB	333	MSPRD0093GEFJ	Lock Release Lever Spring	AA
127	QCNW-7082GEZZ	Full Erase Head Lead	AE	334	MLEVP0143GE00	Slider Lock Cover	AA
128	CLEVP0208GE00	AHC Drive Lever Ass'y	AD	335	LANGF9356GEFW	Slider Lock (Right)	AA
129	CLEVP0209GE00	AHC Roller Ass'y	AG	336	LHLDX1010GE00	Slider Holder (Right)	AB
130	RC-KZ0019GEZZ	Capacitor	AA	337	NGERW1035GEZZ	Drive Gear (Left)	AB
135	94SSEE0193721A	Drum IC	AU	338	MSPRD0089GEFJ	Drive Gear Spring (Left)	AA
136	94SSEE0193731A	Capstan IC	AU	339	LHLDX1015GE00	Cassette Housing Frame (Left)	AC
137	LHLDW1033CE00	Wire Holder	AA	340	NSFTD0015GEFD	Main Shaft	AD
				341	QPWBF2894GEZZ	End Sensor PWB	AB
				342	RH-PX0176GEZZ	Phototransistor	AE
				343	QPWBF3975GEZZ	Start Sensor PWB	AC
				344	QSW-F0040GEZZ	Cassette Switch	AD
				345	ZTAPEZ790008E	Rubber Mat	AB
				347	QSOCN0595GEZZ	Socket, 5 pin	AB
				349	VS2SA937-Q/-1	Transistor	AC
				350	VRD-SA288153J	15k ohm, 1/8W, 5%, Carbon	AA

### CASSETTE HOUSING CONTROL PARTS

	CHLDX3066GE51	Cassette Housing Control Assembly	AY
301	PGIDM0069GE00	Down Guide	AC
302	QSW-F0034GEZZ	Cassette Erase Protection Switch	AC
303	LHLDX1014GE00	Cassette Housing Frame (Right)	AC
304	MARMP0043GE00	Cassette Cover Arm (A)	AA
305	MARMP0044GE00	Cassette Cover Arm (B)	AA
306	NGERW1036GEZZ	Phase Gear	AA
307	MSPRT0290GEFJ	Cassette Cover Arm Reciprocating Spring	AA
308	MSPRD0088GEFJ	Drive Gear Spring (Right)	AA
309	NGERW1034GEZZ	Drive Gear (Right)	AB
310	MSPRT0277GEFJ	Reciprocating Spring	AA
311	NGERW1033GEZZ	Worm Wheel Gear	AB
312	LANGF9355GEFW	Worm Bracket	AB
313	NBRGP0013GEZZ	Bearing	AA
314	MLEVP0142GE00	Open Lever	AA
315	MSPRD0091GEFJ	Open Lever Spring	AA
316	MLEVP0192GEZZ	Switching Lever	AB
317	MSPRT0280GEFJ	Switching Lever Spring	AA
318	NSFTD0016GEFD	Worm Shaft Ass'y	AE
319	MLEVP0140GEZZ	Clutch Lock Lever	AA
320	MSPRT0279GEFJ	Clutch Lock Lever Spring	AA
321	MLEVP0139GEZZ	Clutch Release Lever	AA
322	MSPRD0092GEFJ	Clutch Release Lever Spring	AA
323	MLEVP0138GEZZ	Clutch Lever	AA
324	NPLYV0135GEZZ	Pulley	AA

351	VRD-SA288223J	22k ohm, 1/8W, 5%, Carbon	AA
354	VRD-SA288563J	56k ohm, 1/8W, 5%, Carbon	AA
355	RC-KZ0028GEZZ	0.047 $\mu$ F, 16V, 20%, Ceramic	AA
356	QCNW-4789GEZZ	Connecting Cord	AF
401	LX-WZ1020GE00	Cut Washer (4.2W-6.0-0.5)	AA
402	LX-HZ3046GEFD	Screw (B Tight BTN3P + 6S)	AA
403	NPLYV0137GEZZ	Coupling	AA
404	NPLYV0136GEZZ	Clutch	AA
405	NGERW1037GEZZ	Worm	AA
406	PSPAZ0301GEZZ	Spacer	AD

### SCREWS, NUTS, AND WASHERS

201	XNFSD20-16000	Adjusting Nut	AA
202	XWHS26-05060	Washer W2.6S-6-0.5	AA
203	XRESJ20-04000	E Ring-2	AA
204	LX-BZ3095GEFD	AC Head Screw	AA
205	XBPSD26P06000	Azimuth Adjusting Screw	AA
206	LX-BZ3096GEFD	Tilt Adjusting Screw	AA
207	XNFSD40-31000	Adjusting Nut (A/C Head)	AB
208	LX-WZ1048GEZZ	Washer W3.1-5.4-0.5	AA
209	LX-WZ1041GE00	Washer W2.6-6-0.5 (LM)	AA
210	XHPSD26P06WS0	Screw C2.6P + 6S	AA
211	XRESJ30-06000	E Ring-3	AA

Ref. No.	Part No.	Description	Code	Ref. No.	Part No.	Description	Code
212	XWHJZ45-02060	Washer PSW4.6-6-0.25	AA	611	TLABM2459GEZZ	Label, Model (VC-H91)	AB
213	LX-NZ3046GEFW	Adjusting Nut	AB	611	TLABM2503GEZZ	Label, Model (VC-H91ETS)	AC
215	LX-WZ1003GE00	Washer CW2.1-5-0.5	AA	611	TLABM2458GEZZ	Label, Model (VC-H96)	AB
216	XRESJ12-03000	E Ring-1.2-T0.3	AA	611	TLABM2502GEZZ	Label, Model (VC-H96ETS)	AC
217	XHPSD26P03000	Screw S2.6P + 3S (S Tight)	AA	611	TLABM2526GEZZ	Label, Model (VC-H980)	AB
218	XHPSD20P03000	Screw S2P + 3S (S Tight)	AA	611	TLABM2527GEZZ	Label, Model (VC-H980ETS)	AC
219	XRESJ25-04000	E Ring-2.5	AA	612	LX-HZ3040GEFF	Screw	AA
220	XWHJZ25-05050	Washer W2.6P-5-0.5	AA	613	LX-HZ3047GEFF	Screw	AA
221	XWHJZ25-01050	Washer W2.6P-5-0.13	AA	614	XEBSD40P12000	Screw	AA
222	XWHJZ25-02050	Washer W2.6P-5-0.25	AA	615	XESSF30P12000	Screw	AA
223	LX-HZ3043GEZZ	Screw W2.6P + 6S	AA	616	XHPS330P06WS0	Screw	AA
224	LX-BZ3099GEZZ	Screw WSW2P + 11S (W5)	AB	617	XEBSD30P12000	Screw	AA
225	LX-XZ3030GEFD	Screw M2x4	AC	618	LANGF9367GEFW	Fixing Metal	AB
226	XHPSD26P08WS0	Screw C2.6P + 8S	AA	619	LANGF5060GEFW	Angle	AB
227	XJPSD26P08WS0	B Tight Screw C2.6 + 8S	AA	620	LX-HZ3056GEFD	Screw	AA
228	XHPSD30P08WS0	Screw C3P + 8S	AA	621	PSPAZ0317GEZZ	Spacer	AA
229	LX-WZ1040GE00	Washer CW2.5-6-0.5	AA	622	LHLDZ1806GEZZ	Holder (Except VC-H980, VC-H980ETS)	AB
230	XJBSD20P06000	B Tight Screw 2P + 6S	AA	622	LHLDZ1843GEZZ	Holder	AB
232	LX-HZ3056GEFD	Screw WSW3P + 10S-6W	AA			(VC-H980, VC-H980ETS)	
233	LX-BZ3064GEFN	Screw SW3P + 6S-Ni	AA	623	LHLDZ1844GEZZ	Holder, LED PWB (Except VC-H980, VC-H980ETS)	AD
234	XBPSD26P12J00	Screw SW2.6 + 12S	AA	624	LHLDP1128GEZZ	Holder, LED (Except VC-H980, VC-H980ETS)	AC
235	XBPSD30P05J00	Screw SW3P + 5S	AA			(VC-H980, VC-H980ETS)	
237	XHPSD30P06000	Screw S3P + 6S	AA	625	LHLDZ1845GEZZ	Mic Amp PWB Holder	AD
238	LX-RZ3001AEZZ	E Ring-3 (Curl)	AA			(VC-H980, VC-H980ETS)	
239	LX-WZ1042GE00	Washer CW2.7-7-0.5	AA	626	LHLDZ1864GEZZ	Mic Jack PWB Holder	AC
242	XWHJZ25-04050	Washer W2.6P-5-0.4	AA			(VC-H980, VC-H980ETS)	
244	XHPSD30P04WS0	Screw C3P + 4S	AA	627	LHLDZ1778GEZZ	Holder, Main PWB	AB

### MECHANICAL PARTS

601	GCABB1118GEZZ	Main Frame	AT
602	CCABA3072GE04	Upper Cabinet Ass'y (VC-H91, VC-H91ETS)	AS
602-1	GCABA3072GESJ	Upper Cabinet (VC-H91, VC-H91ETS)	AR
602-2	TCADZ3065GEZZ	Caution Label (VC-H91, VC-H91ETS)	AC
602	GCABA3072GESJ	Upper Cabinet (Except VC-H91, VC-H91ETS)	AR
603	GBDYU3075GEZZ	Bottom Plate	AH
604	GCOVA1740GEZZ	Antenna Terminal Cover (VC-H91, VC-H91ETS)	AF
604	GCOVA1736GEZZ	Antenna Terminal Cover (VC-H96, VC-H96ETS)	AF
604	GCOVA1738GEZZ	Antenna Terminal Cover (VC-H980, VC-H980ETS)	AF
605	LHLDP1089GE00	LED Holder	AA
606	LHLDZ1780GEZZ	Holder, Power	AC
607	LHLDZ1804GEZZ	Holder, Fluorescent Display Tube	AD
608	LHLDZ1779GEZZ	Holder, RF Converter	AC
609	MHNG-1060GEZZ	Hinge, Main PWB	AA
610	QEARP0360GEFW	Earth Plate	AB

### FRONT PANEL PARTS

501	CPNLC1738GE01	Front Panel Ass'y (VC-H91, VC-H91ETS)	BC
501	CPNLC1738GE02	Front Panel Ass'y (VC-H96, VC-H96ETS)	BC
501	CPNLC1738GE04	Front Panel Ass'y (VC-H980)	BC
501	CPNLC1738GE05	Front Panel Ass'y (VC-H980ETS)	BD
501-2	CDORF2058GE01	Door Ass'y (VC-H91, VC-H91ETS)	AM
501-2	CDORF2057GE01	Door Ass'y (VC-H96, VC-H96ETS)	AM
501-2	CDORF2106GE01	Door Ass'y (VC-H980, VC-H980ETS)	AM
501-2-2	TLABH0490GEZZ	Door Label	AB
501-2-3	HBDGB1007GESA	Badge, "SHARP"	AD
501-3	HDECQ0886GESA	Decoration Panel (VC-H91, VC-H91ETS)	AG
501-3	HDECQ0897GESA	Decoration Panel (VC-H96, VC-H96ETS)	AL

C-H91/H91ETS  
C-H96/H96ETS  
C-H980/H980ETS

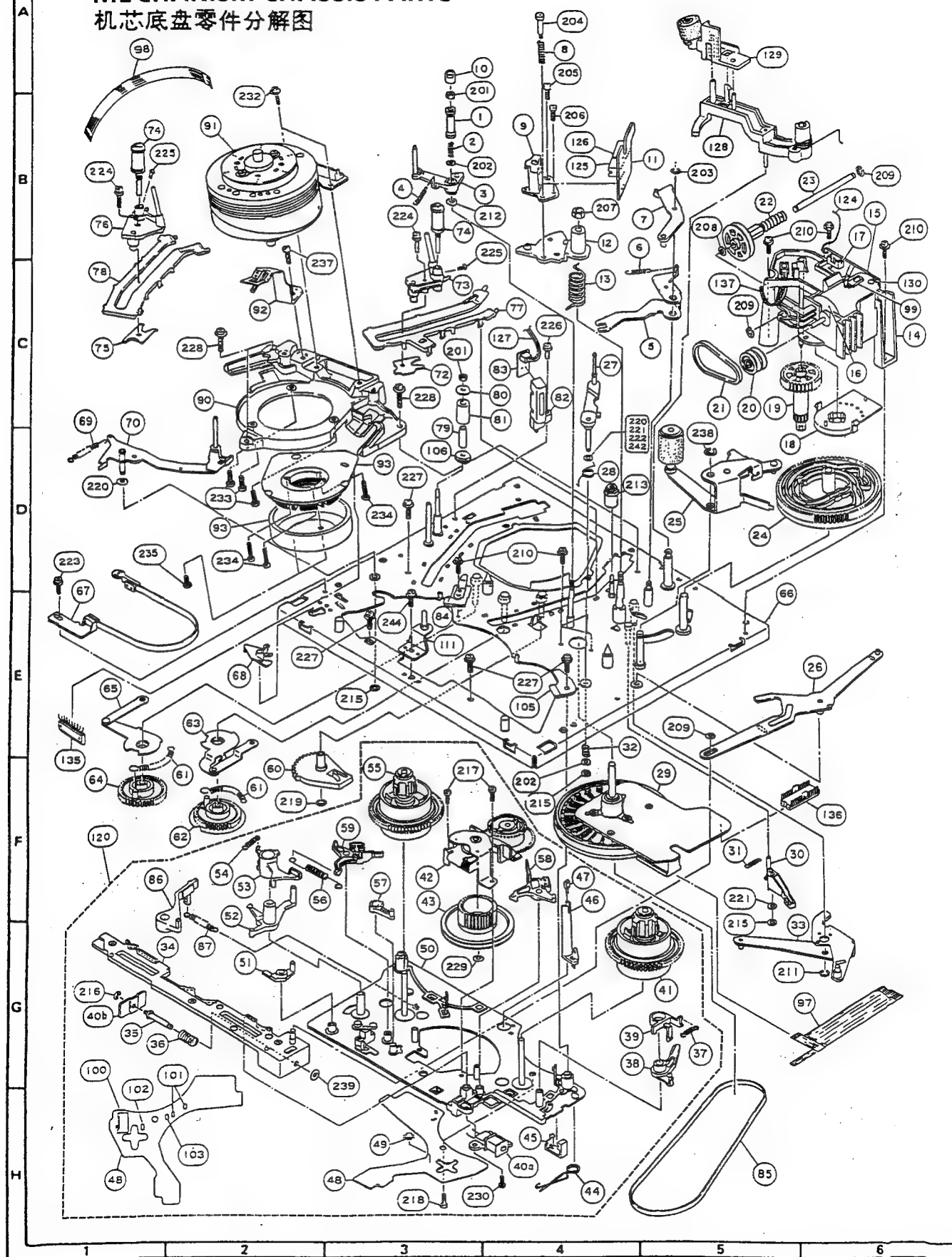
Ref. No.	Part No.	Description	Code	Ref. No.	Part No.	Description	Code
501-3	HDECQ0971GESA	Decoration Panel (VC-H980, VC-H980ETS)	AL	501-10	HiNDP1892GESA	Indication Panel (VC-H96, VC-H96ETS)	AF
501-4	HiNDP1868GESA	Indication Panel (VC-H91, VC-H91ETS)	AC	501-10	HiNDP1870GESA	Indication Panel (VC-H980, VC-H980ETS)	AF
501-4	HiNDP1873GESA	Indication Panel (VC-H96, VC-H96ETS)	AC	501-11	HDECQ0891GESA	Decoration Panel (Leg)	AE
501-4	PSPAZ0348GEZZ	Spacer (VC-H980, VC-H980ETS)	AC	501-12	QEARP0354GEFW	Earth Plate (Bottom)	AB
501-5	JB TN-2524GESA	Button, Key Control (VC-H980, VC-H980ETS)	AC	501-13	QEARP0355GEFW	Earth Plate (Indication Plate)	AB
501-6	CDECQ0933GE01	Cassette Flap Ass'y (VC-H91, VC-H91ETS)	AM	501-14	PCOVU9205GESB	Display Filter	AD
501-6-2	HDECQ0903GESA	Rib (VC-H91, VC-H91ETS)	AB	501-15	JB TN-2508GESA	Button, REC	AE
501-6	HDECQ0932GESD	Cassette Flap (VC-H96, VC-H96ETS)	AK	501-16	TLABZ0945GEZZ	Feature Label (VC-H91, VC-H91ETS)	AE
501-6	HDECQ0970GESB	Cassette Flap (VC-H980)	AG	501-16	TLABZ0944GEZZ	Feature Label (VC-H96, VC-H96ETS)	AE
501-6	HDECQ0972GESB	Cassette Flap (VC-H980ETS)	AK	501-16	TLABZ0974GEZZ	Feature Label (VC-H980)	AF
501-7	LANGF9522GEFW	Cassette Angle	AA	501-16	TLABZ0978GEZZ	Feature Label (VC-H980ETS)	AL
501-8	MSPRD0123GEFJ	Cassette Spring	AA	501-17	CB TN-2523GE01	Button Ass'y	AD
501-9	HDECQ0890GESA	Front Display Window	AK	501-17-2	GCOVA1734GESA	LED Cover	AB
501-10	HiNDP1893GESA	Indication Panel (VC-H91, VC-H91ETS)	AG	501-18	LHLD51010GEZZ	Door Holder	AA
				501-19	XJPSD20P06XS0	Cassette Flap Screw	AA

# EXPLODED VIEWS

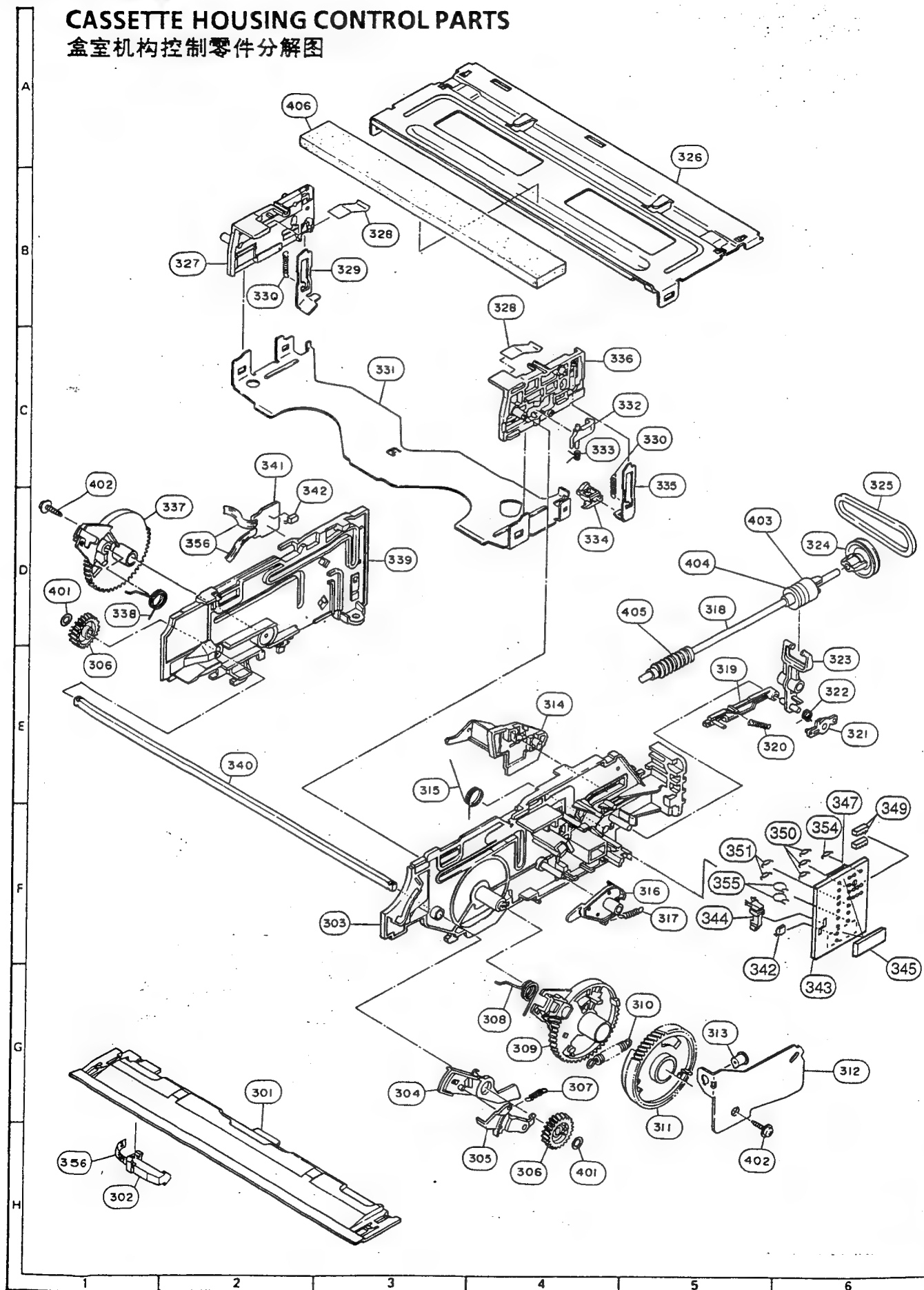
零件分解图

## MECHANISM CHASSIS PARTS

机芯底盘零件分解图

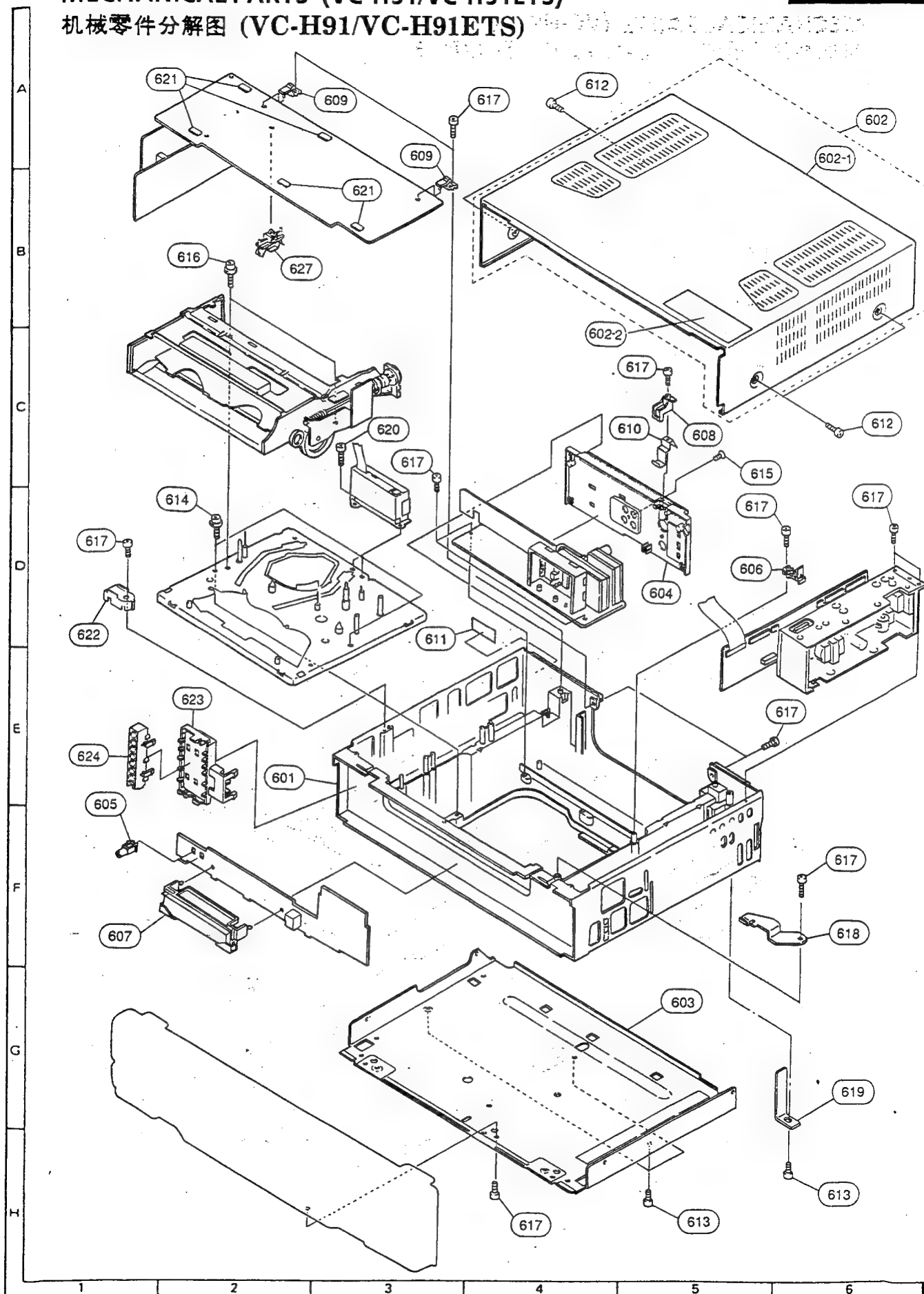


# CASSETTE HOUSING CONTROL PARTS 盒室机构控制零件分解图



# MECHANICAL PARTS (VC-H91/VC-H91ETS)

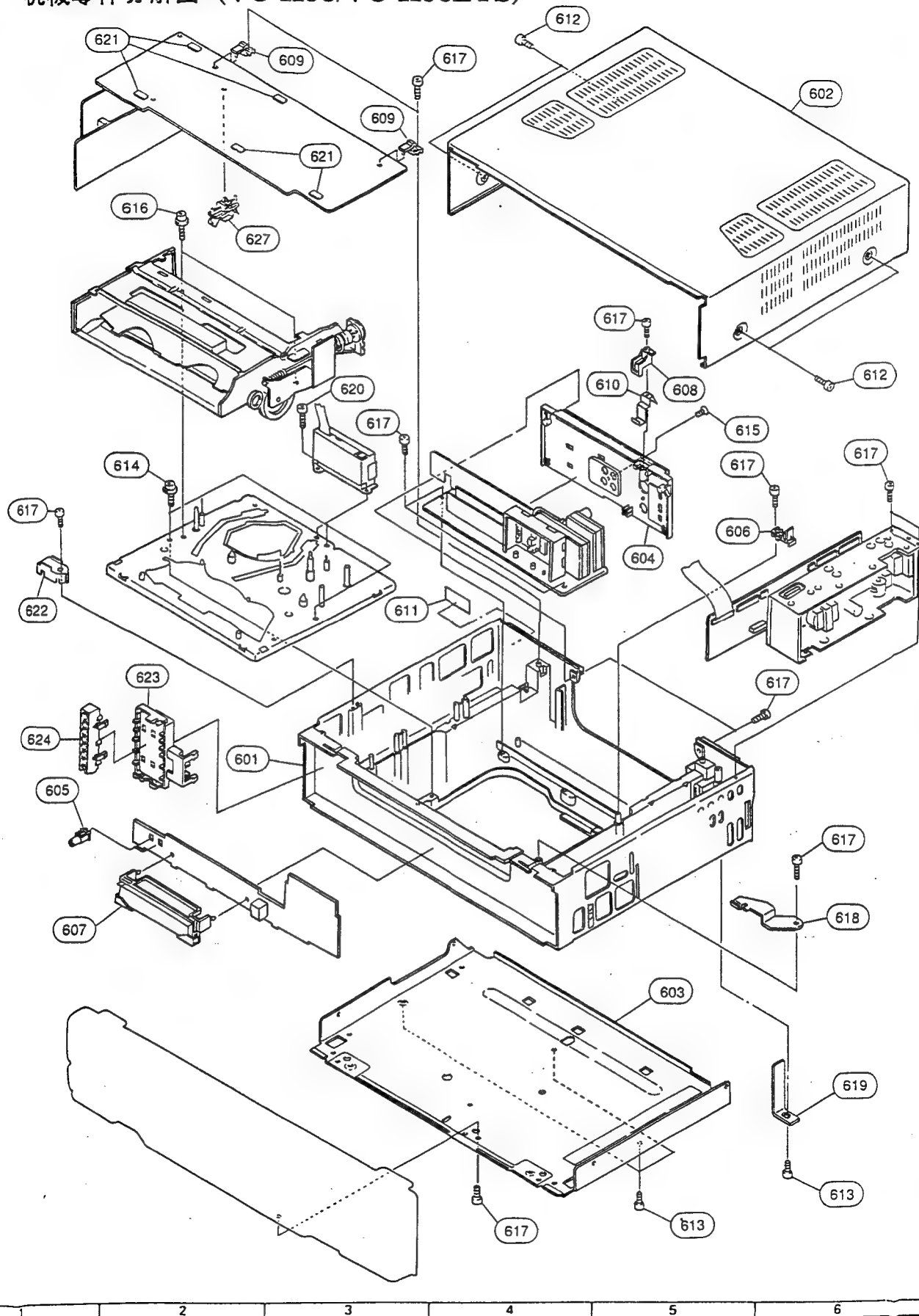
## 机械零件分解图 (VC-H91/VC-H91ETS)





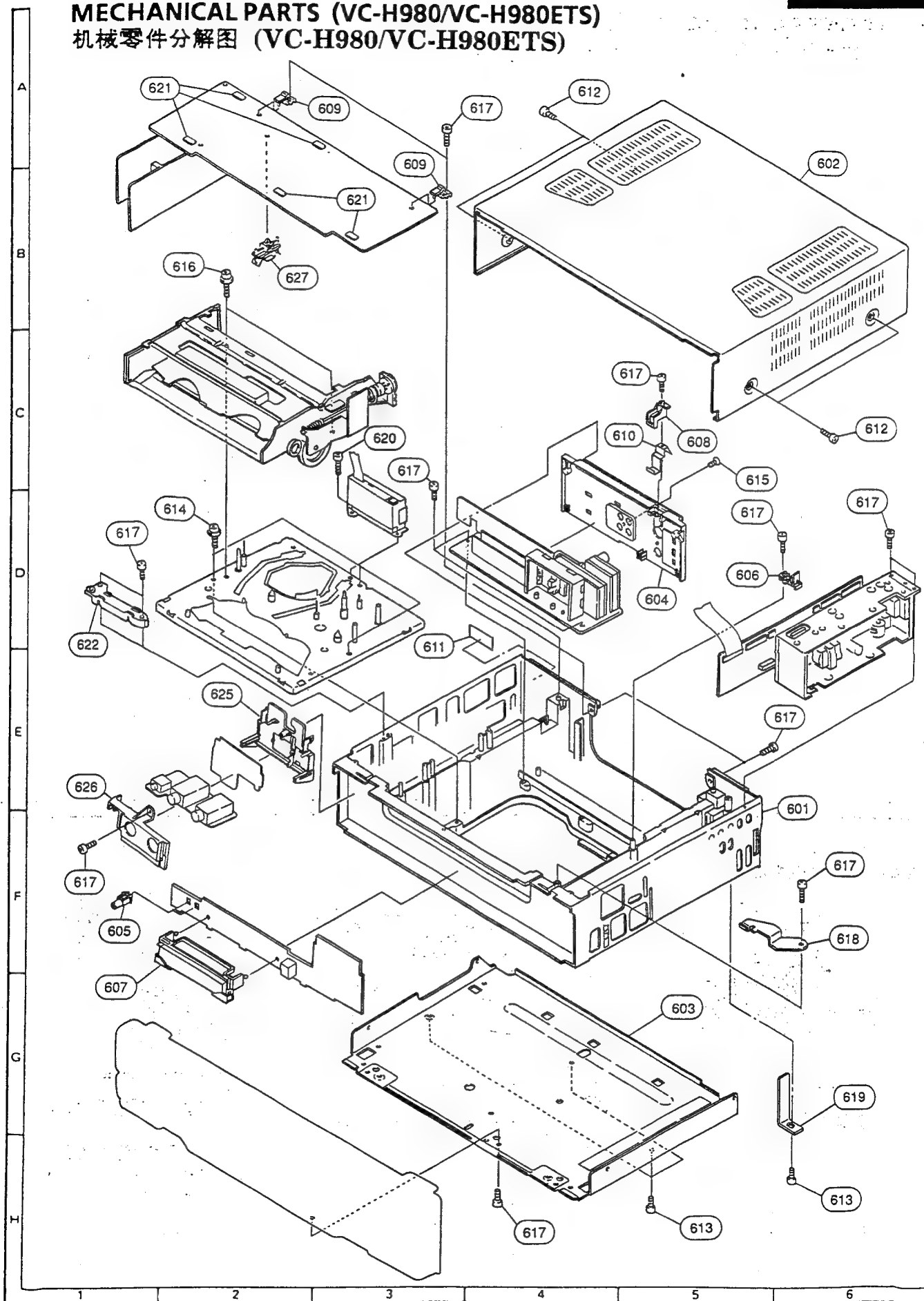
# MECHANICAL PARTS (VC-H96/VC-H96ETS)

## 机械零件分解图 (VC-H96/VC-H96ETS)

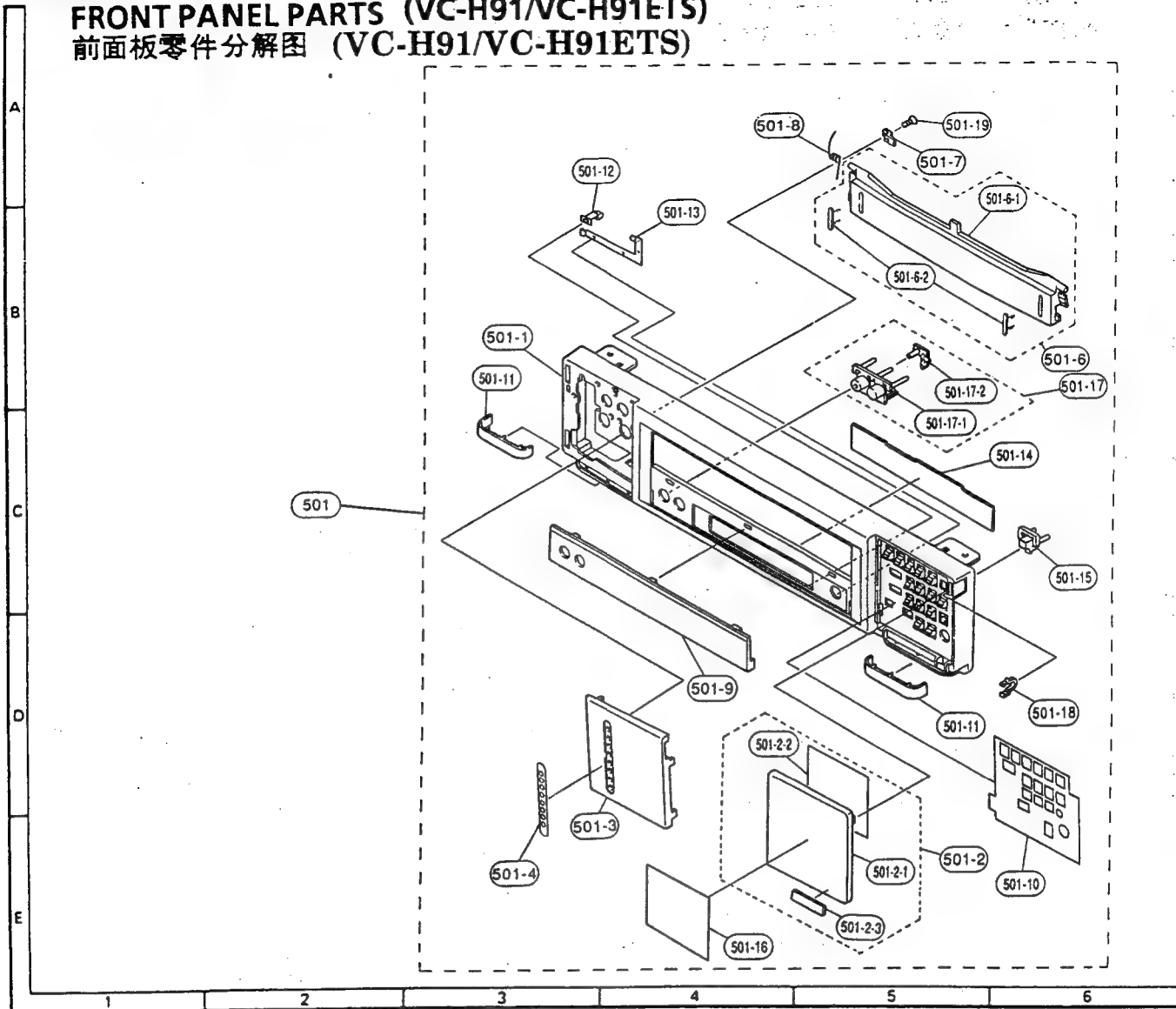


# MECHANICAL PARTS (VC-H980/VC-H980ETS)

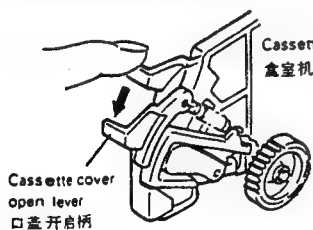
## 机械零件分解图 (VC-H980/VC-H980ETS)



## FRONT PANEL PARTS (VC-H91/VC-H91ETS) 前面板零件分解图 (VC-H91/VC-H91ETS)

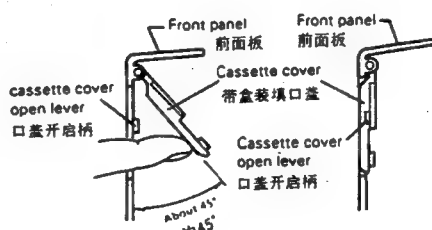


### PRECAUTIONS ON FRONT PANEL SET-UP 前面板装配时的注意事项



Before attaching the front panel in position, make sure that the cassette cover open lever is in its right place (lowermost) if it is out of position, push it down with a finger.

安置前面板就位之前, 必须先检查口盖开启柄是否置于正当位置 (最下位置), 否则, 用手指向下按压口盖开启柄。

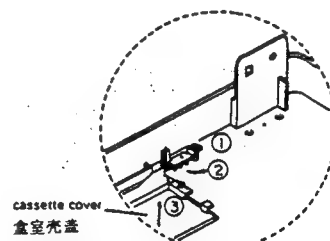


keep the cassette cover about 45° open and make sure that the cassette cover open lever is between the front panel and the cassette cover. Now fix the front panel in place.

保持将带盒装填口盖开启为约45°的状态; 然后确认口盖开启柄位于前面板与带盒装填口盖之间, 这样便可将前面板安装在规定位置上。

Do not mount the front panel with the cassette cover tilted too open. Otherwise the cassette cover might wrongly run on the cassette housing.

带盒装填口盖开启度过大时, 切勿安装前面板, 否则装填录象带于盒室机构内时, 会导致其口盖开启动作不当。



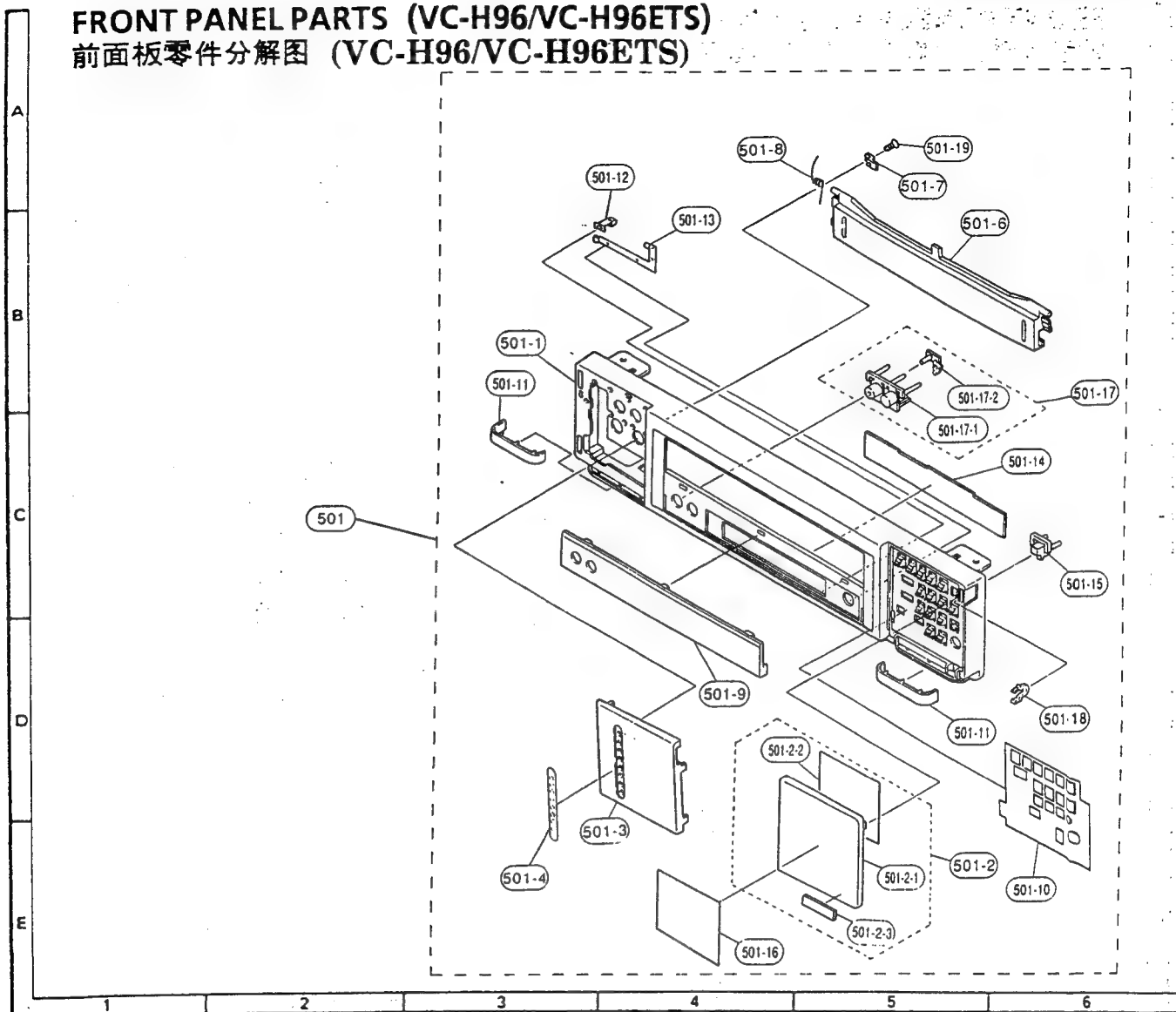
Removing the cassette compartment cover

1. Loosen the screw ① and turn the fixing metal in the direction of the arrow ②.
2. Lift up the cassette compartment cover in the direction of arrow ③ and remove it from the front panel.

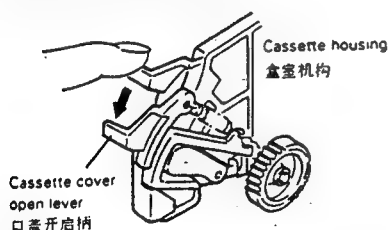
盒室壳盖的拆除

1. 松旋螺丝①后, 按上图箭头②的方向旋转定位金属。
2. 接着, 按箭头③所示方向, 向上提起盒室壳盖, 这样便可将其从前面板上拆除。

# FRONT PANEL PARTS (VC-H96/VC-H96ETS) 前面板零件分解图 (VC-H96/VC-H96ETS)

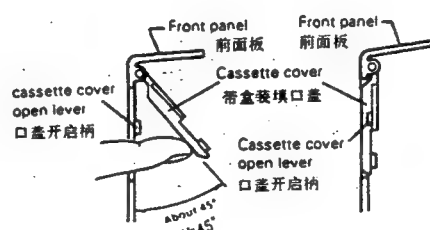


## PRECAUTIONS ON FRONT PANEL SET-UP 前面板装配时的注意事项



Before attaching the front panel in position, make sure that the cassette cover open lever is in its right place (lowermost). If it is out of position, push it down with a finger.

安置前面板就位之前, 必须先检查口盖开启柄是否置于正当位置(最下位置), 否则, 用手指向下按压口盖开启柄。

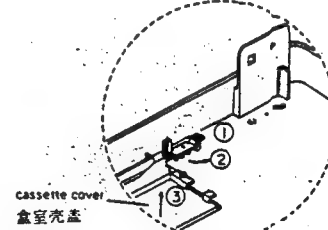


keep the cassette cover about 45° open and make sure that the cassette cover open lever is between the front panel and the cassette cover. Now fix the front panel in place.

保持将带盒装填口盖开启为约45°的状态; 然后确认口盖开启柄位于前面板与带盒装填口盖之间, 这样便可将前面板安装在规定位置上。

Do not mount the front panel with the cassette cover tilted too open. Otherwise the cassette cover might wrongly run on the cassette housing.

带盒装填口盖开启度过大时, 切勿安装前面板, 否则装填录象带于盒室机构内时, 会导致其口盖开启动作不当。



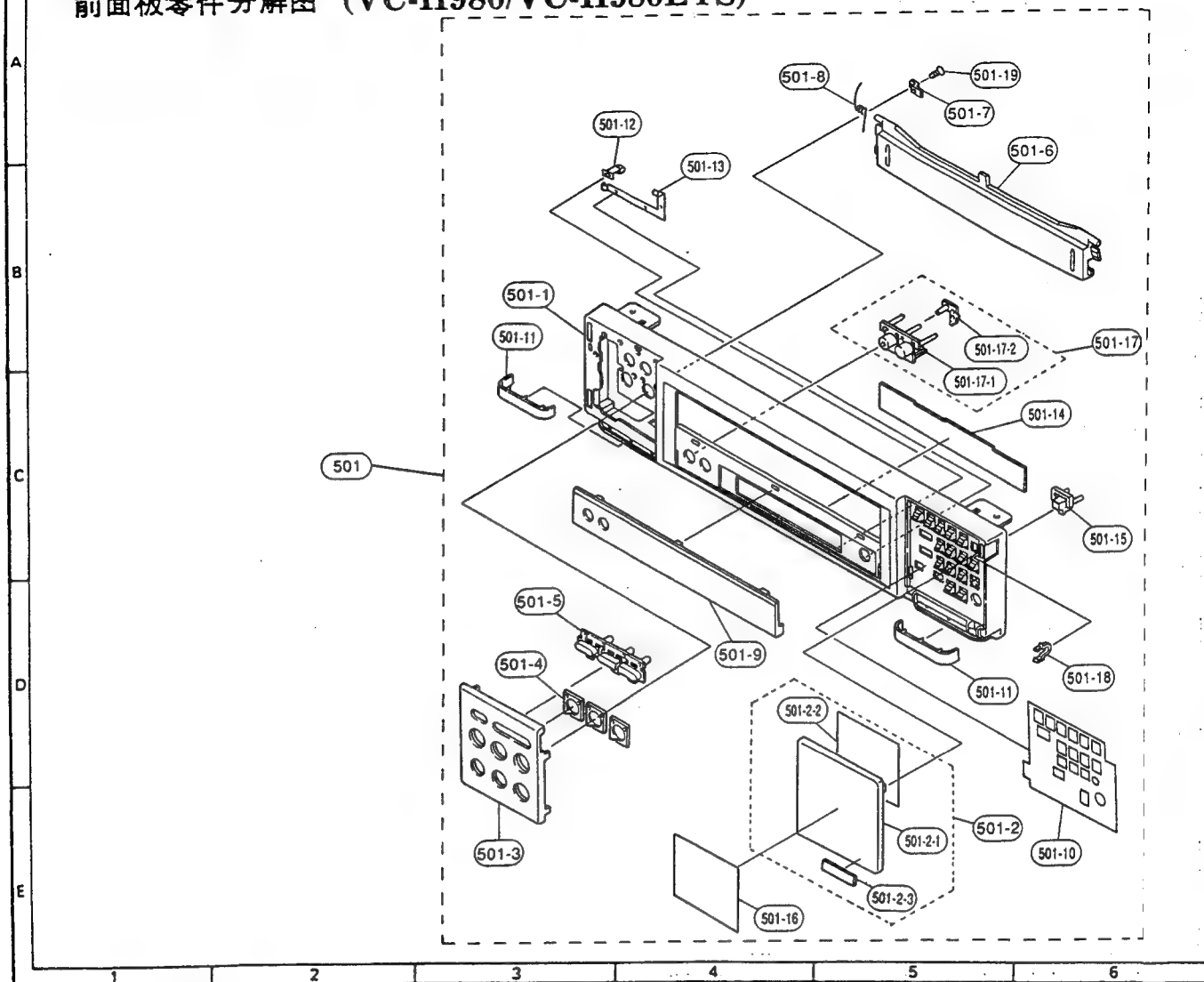
Removing the cassette compartment cover.

1. Loosen the screw ① and turn the fixing metal in the direction of the arrow ②.
2. Lift up the cassette compartment cover in the direction of arrow ③ and remove it from the front panel.

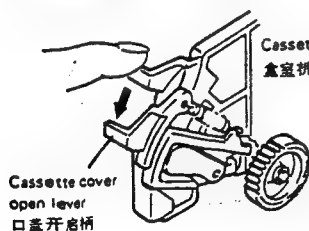
盒室壳盖的拆除

1. 松旋螺丝①后, 按上箭头②的方向旋转定位金属。
2. 接着, 按箭头③所示方向, 向上提起盒室壳盖, 这样便可将其从前面板上拆除。

# FRONT PANEL PARTS (VC-H980/VC-H980ETS) 前面板零件分解图 (VC-H980/VC-H980ETS)

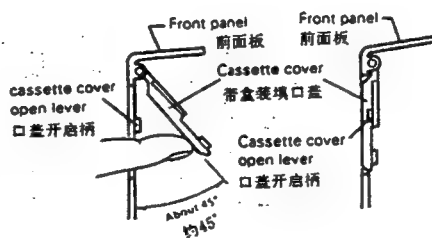


## PRECAUTIONS ON FRONT PANEL SET-UP 前面板装配时的注意事项



Before attaching the front panel in position make sure that the cassette cover open lever is in its right place (lowermost). If it is out of position, push it down with a finger.

安置前面板就位之前，必须先检查口盖开启柄是否置于正当位置（最下位置），否则，用手指向下按压口盖开启柄。

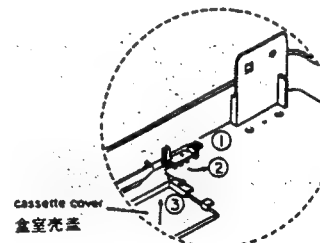


keep the cassette cover about 45° open and make sure that the cassette cover open lever is between the front panel and the cassette cover. Now fix the front panel in place.

保持将带盒装填口盖开启为约45°的状态；然后确认口盖开启柄位于前面板与带盒装填口盖之间，这样便可将前面板安装在规定位置上。

Do not mount the front panel with the cassette cover tilted too open. Otherwise the cassette cover might wrongly run on the cassette housing.

带盒装填口盖开启度过大时，切勿安装前面板，否则装填录象带于盒室机构内时，会导致其口盖开启动作不当。



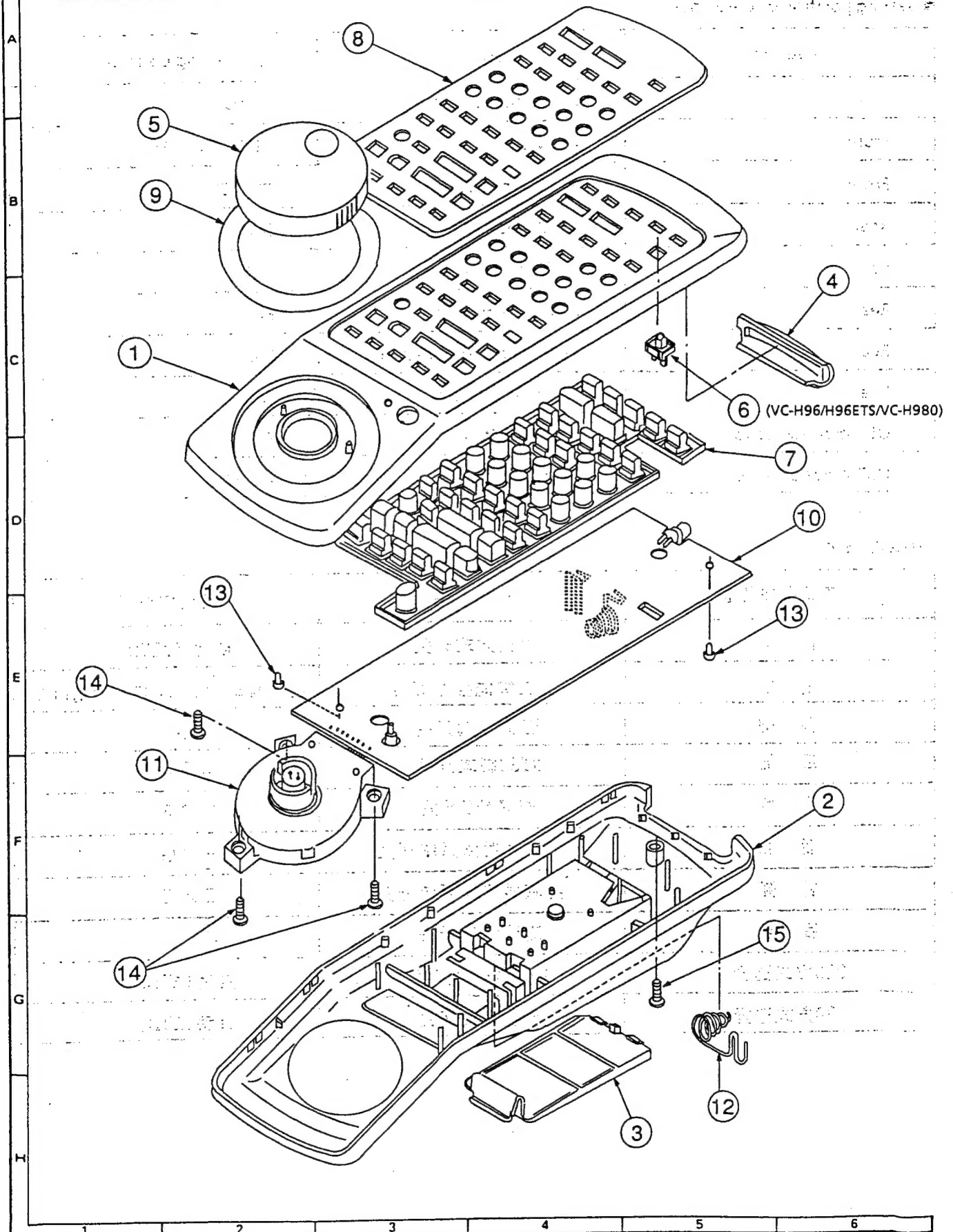
Removing the cassette compartment cover.

1. Loosen the screw ① and turn the fixing metal in the direction of the arrow ②.
2. Lift up the cassette compartment cover in the direction of arrow ③ and remove it from the front panel.

盒室亮盖的拆除

1. 松旋螺丝①后，按上图中箭头②的方向旋转定位金属。
2. 接着，按箭头③所示方向，向上提起盒室亮盖，这样便可将其从前面板上拆除。

# INFRARED REMOTE CONTROL UNIT 红外线遥控器电路



## PACKING OF THE SET 包装方法

### ■ Setting position of the Knobs

Position	Switch	Setting position
Front	Colour mode switch	AUTO
Front	AI switch	AUTO PICTURE
Front	Picture tone volume	CENTER
Rear	NTSC mode switch	3.58
Rear	Audio ATT. switch	OFF
Rear	IF/RF system switch	B/G
Rear	RF converter system switch	B/G
Rear	Test signal switch	OFF
OSD mode selection	NICAM switch	AUTO
OSD mode selection	Blue back switch	AUTO

### ● 各旋钮设定方法

开关所在位置	开 关	开关设定位置
前 部	彩色方式开关	自动 (AUTO)
前 部	人工智能控制开关	图象自动控制 (AUTO PICTURE)
前 部	图象色调开关	中央
后 侧	NTSC制式开关	3.58
后 侧	音频ATT开关	OFF
后 侧	中频/射频系统开关	B/G
后 侧	射频转换器系统开关	B/G
后 侧	测试信号开关	OFF
OSD方式选择	NICAM制式开关	自动 (AUTO)
OSD方式选择	蓝色背景开关	自动 (AUTO)

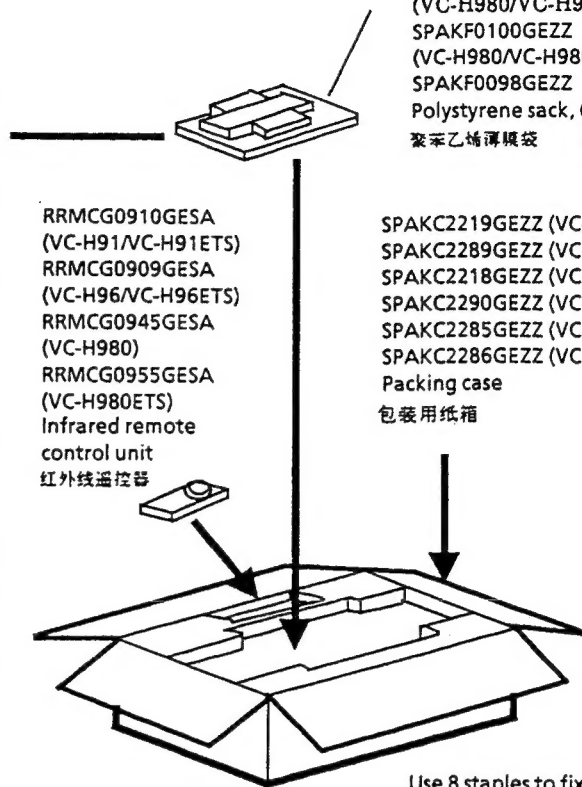
**Accessories**  
附属品

- ★ TiNS-2031GEZZ Operation manual  
使用说明书  
(VC-H91/VC-H91ETS)
- ★ TiNS-2004GEZZ Operation manual  
使用说明书  
(VC-H96/VC-H96ETS)
- ★ TiNS-2056GEZZ Operation manual  
使用说明书  
(VC-H980)
- ★ TiNS-2065GEZZ Operation manual  
使用说明书  
(VC-H980ETS)
- ★ QCNW-5650GEZZ Antenna cord  
天线延长引线
- QACCZ3011GEZZ AC cord  
交流电源引线  
(VC-H91/VC-H96/VC-H980)
- QACCV2033GEZZ AC cord  
交流电源引线  
(VC-H91ETS/VC-H96ETS/  
VC-H980ETS)
- ★ QPLGA0011CEZZ AC plug adapter  
交流插塞式接合器  
(VC-H91/VC-H96/VC-H980)
- ★ Battery  
电池

- ★ SPAKF0099GEZZ  
(Except VC-H980/VC-H980ETS)  
(VC-H980/VC-H980ETS除外)  
SPAKF0100GEZZ  
(VC-H980/VC-H980ETS)  
SPAKF0098GEZZ  
Polystyrene sack, Case  
聚苯乙烯薄膜袋 纸箱

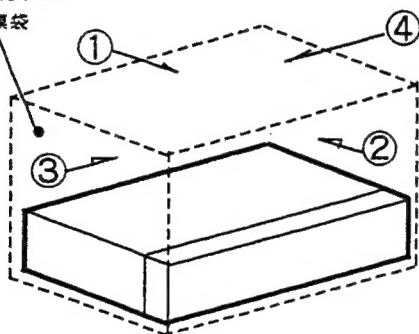
- RRMCG0910GESA  
(VC-H91/VC-H91ETS)
- RRMCG0909GESA  
(VC-H96/VC-H96ETS)
- RRMCG0945GESA  
(VC-H980)
- RRMCG0955GESA  
(VC-H980ETS)
- Infrared remote  
control unit  
红外线遥控器

- SPAKC2219GEZZ (VC-H91)
- SPAKC2289GEZZ (VC-H91ETS)
- SPAKC2218GEZZ (VC-H96)
- SPAKC2290GEZZ (VC-H96ETS)
- SPAKC2285GEZZ (VC-H980)
- SPAKC2286GEZZ (VC-H980ETS)
- Packing case  
包装用纸箱

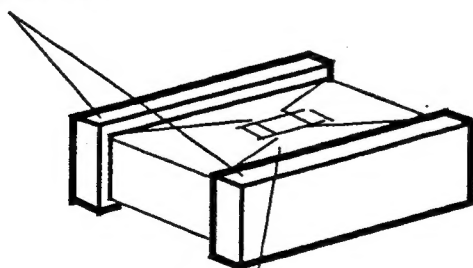


Use 8 staples to fix the  
bottom of packing case  
用8支U形钉封合  
包装箱底部

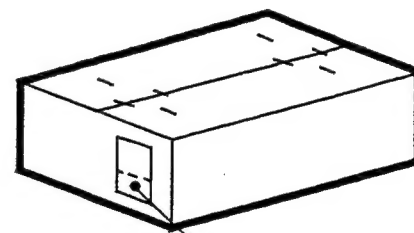
- ★ SPAKP0045GEZZ  
Polystyrene sack  
聚苯乙烯薄膜袋



- ★ SPAKX0751GEZZ (Except VC-H980/VC-H980ETS)  
(VC-H980/VC-H980ETS除外)
- ★ SPAKX0752GEZZ (VC-H980/VC-H980ETS)  
Buffer material  
防震泡沫塑料衬垫



Fix with craft tape  
粘胶标记带



- TLABK2459GEZZ (VC-H91)
- TLABK2503GEZZ (VC-H91ETS)
- TLABK2458GEZZ (VC-H96)
- TLABK2502GEZZ (VC-H96ETS)
- TLABK2526GEZZ (VC-H980)
- TLABK2527GEZZ (VC-H980ETS)
- No. card  
出厂编号标签

MARK ★ Not Replacement Item

★ 记号者为非更换品目



H91/H91ETS  
H96/H96ETS  
H980/H980ETS

# SHARP

禁 持 出

PUBLIC RELATIONS SECTION  
USE ONLY

電子機器事業本部  
商品信頼性管理センター

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